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**Social Science Text-Books**

EDITED BY RICHARD T. ELY, Ph.D., LL.D.

*President of the Institute for Economic Research and Honorary Professor of  
Economics, University of Wisconsin*

**APPLIED EUGENICS**



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**President of the Institute for Economic Research  
and Research Professor of Economics, in  
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# APPLIED EUGENICS

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## PREFACE TO THE REVISED EDITION

This revision of *Applied Eugenics* after fifteen years has not necessitated any significant change in the social philosophy, the science, or the technology of eugenics as presented in the first edition, in 1918. While there is scarcely a page of the book that has not been entirely rewritten, the purpose of this has been mainly to bring in the great body of new evidence. Opportunity has also been taken to explore more fully certain aspects of eugenics, because of studies and experiences of the authors in the intervening years. Since the book has found widespread use as a college textbook (including two editions in the Japanese language), pains have been taken in this revision to increase the number of citations to original studies on which conclusions have been based. Teachers have also been provided, in Appendix C, with some suggestions for the development of an interest in eugenics on the part of students.

On the whole, the progress of eugenics in the United States since 1918 has been greater than the authors at that time would have dared to hope. If the next decade or two can show as much progress, and at the same time avoid another world war, the eugenic welfare of the human race will be measurably advanced.

P. P.

R. H. J.

July, 1933



## PREFACE TO THE FIRST EDITION

The science of eugenics consists of a foundation of biology and a superstructure of sociology. Galton, its founder, emphasized both parts in due proportion. Until recently, however most sociologists have been either indifferent or hostile to eugenics, and the science has been left for the most part in the hands of biologists, who have naturally worked most on the foundations and neglected the superstructure. Although we are not disposed to minimize the importance of the biological part, we think it desirable that the means of applying the biological principles should be more carefully studied. The reader of this book will, consequently, find only a summary explanation of the mechanism of inheritance. Emphasis has rather been laid on the practical means by which society may encourage the reproduction of superior persons and discourage that of inferiors.

We assume that in general, a eugenically superior or desirable person has, to a greater degree than the average, the germinal basis for the following characteristics: to live past maturity, to reproduce adequately, to live happily, and to make contributions to the productivity, happiness, and progress of society. It is desirable to discriminate as much as possible between the possession of the germinal basis and the observed achievement, since the latter consists of the former plus or minus environmental influence. But where the amount of modification is too obscure to be detected, it is advantageous to take the demonstrated achievement as a tentative measure of the germinal basis. The problem of eugenics is to make such legal, social, and economic adjustments that (1) a larger proportion of superior persons will have children than at present, (2) that the average number of offspring of each superior person will be greater than at present, (3) that the most inferior persons will have no children, and finally that (4) other inferior persons will

have fewer children than now. The science of eugenics is still young and much of its program must be tentative and subject to the test of actual experiment. It is more important that the student acquire the habit of looking at society from a biological as well as a sociological point of view, than that he put his faith in the efficacy of any particular mode of procedure.

The essential points of our eugenics program were laid down by Professor Johnson in an article entitled "Human Evolution and Its Control" in the *Popular Science Monthly* for January, 1910. Considerable parts of the material in the present book have appeared in the *Journal of Heredity*. Helpful suggestions and criticism have been received from several friends, in particular Sewall Wright and O. E. Baker of the United States Department of Agriculture.

PAUL POPENOE

WASHINGTON, D. C.  
June, 1918

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# APPLIED EUGENICS

## CHAPTER I

### NATURE OR NURTURE

No profound knowledge of human nature is needed to discover that all babies are different from each other, and that any baby is more likely to resemble his own parents than he is to resemble some other baby's parents.

Yet from that simple observation the whole science of eugenics can be deduced; for it is evident that if different types of parents are having babies, and bringing them up, in different proportions, the make-up of the next generation will not be the same as that of this generation.

In this way, the character of a people may be changed markedly in the course of a few centuries.

The differences between children are not only seen when they are studied as babies; differences in activity are felt by the mothers before the babies are born. When the child becomes old enough to be subjected to systematic tests, the differences are measurable.

But perhaps even more convincing to the average parent is his knowledge of the differences among his own children, brought up in the same home. While the training and surroundings of no two children are exactly alike, even in the same home, yet it is hard for most parents to believe that the differences are great enough to account for the differences in appearance, talents, and achievement; just as it is difficult for most parents to believe that, by any conceivable amount of teaching or

NOTE. Superior numbers appearing throughout text refer to Appendix A, List of References

training, their children can be made to grow beyond a certain limit,—whether that growth be physical or mental.

So far as physical traits are concerned, it is generally recognized that the child's, or the adult's, make-up is the outgrowth of his inborn constitution. Though the baby's eyes are blue at first, it occasions no surprise to find them turning brown in three or six months, if his parents' eyes are also brown. No one feels called upon to challenge the importance of his in-born constitution, and to say that the change in color of his eyes is due to the favorable advantages given him in his cradle. It is generally recognized that the various traits make themselves manifest at the natural time in the child's process of maturation; that his teeth will appear in due course, that he is likely after adolescence to have a large frame because he comes of a large framed family, and that the family bald spot will probably appear in him at about the same age that it showed in his father.

When it is a question of intellectual development, this relationship is sometimes not recognized so clearly. It is therefore worth while to investigate the problem by more exact methods.

For this purpose a study <sup>12</sup> made in California by Barbara S. Burks is unrivaled. Dr. Burks followed up 200 cases in which a child had been adopted at birth or within the first year (average age 3 months).<sup>\*</sup> Only those placed with white, English-speaking foster parents were included. When studied they ranged from 5 to 14 years of age. They were matched with 100 sets of parents who had children of their own, as a control. The effect of heredity, in the latter case, could be contrasted with the effect of no heredity, in the first case, and the intelligence of the children under these circumstances could also be

<sup>\*</sup> The fact that the children were placed as infants is of the greatest importance. If they are placed when older, two factors arise to confuse the interpretation of the results. (1) The influence of the environment, if it exists, has already had time to make itself felt. (2) There is a likelihood of "selective placement," that is, the more intelligent families may tend to take the more intelligent babies. A valuable study in Chicago <sup>13</sup> is subject to these sources of error.

considered in relation to the family surroundings and home conditions.

In other words, if intelligence were a threefold product of training, imitation of parents, and good surroundings, the foster children ought to be just as much like their foster parents, under the same degree of good home conditions, as true children of the same age are like their true parents.

Of course, no such condition was found. It appeared that under such circumstances the differences in intelligence among children are due, to the extent of probably 75% or 80%, to heredity.

Home environment accounts for probably 17% of the differences, in this study. It is by no means negligible, and every child should be given the best home environment possible; but to expect that improvement of home conditions can offset marked differences in heredity is found by this analysis to be expecting too much,—as parents already knew, from their own experiences.

Yet home environment is more important than school environment in producing such differences as children exhibit in the performance of mental tests. Another study<sup>62</sup> developed data which lead to the conclusion that not more than 5% of the differences in intelligence of children (as measured by the Intelligence Quotient) are due to differences in their schooling.

While the I.Q. measures only one aspect of abstract intellect, and while it is far from infallible, it has been found by years of testing, involving millions of subjects, to be a convenient, rough-and-ready indication of the intellectual level. In the standard conditions of American life, differences in the I.Q. are largely determined by innate endowment.

Again the problem may be approached by studying children in orphanages. If intelligence is modified largely by surroundings, the children who have grown up in an orphanage from an early age, all receiving the same training, ought to be much more alike than are those who have grown up, each one in a different family, representing all sorts of cultural and economic

backgrounds. But this turns out not to be the case, in any marked degree. In the study<sup>23</sup> of more than 1,000 children in Texas orphanages, the resemblance between siblings was found to be just about the same as the resemblance between siblings in ordinary private homes.

On the other hand, when unrelated orphans, who had spent at least one-fourth of their lives in Canadian orphanages, were compared with each other, there was found to be no regular resemblance between pairs of them<sup>163</sup>

In short, the similarity of environment in Canada had not made any two orphans more like each other than are any two children picked up at random on the street; while the similarity of environment in Texas had not made brothers, or sisters, more or less like each other than ordinary brothers and sisters.

An interesting study in England proceeded along similar lines by considering illegitimate children who had been given up soon after birth, and who had been reared in an institution together. Children of merchants and professional men averaged 101 I.Q., while those of laborers averaged only 92 I.Q., although they had all been brought up in the same uniform environment and none had had contact with parents. Children living with their parents and attending public schools in London were selected as controls. Those who came from the upper socio-economic levels averaged 105 I.Q., those from the lowest averaged 96 I.Q. In other words, there was about the same difference between those brought up in an institution, without contact with parents, and those living at home with their parents. Children whose fathers came from upper vocational groups had greater intelligence, regardless of where brought up.

Another line of study which has been fruitful is that of twins. This began with Francis Galton, the father of eugenics, but has been carried much farther during the past decade.

There are, everyday observation shows, two kinds of twins,—ordinary twins and the so-called identical twins. Ordinary twins are merely brothers, or sisters, or brother and sister, who



FIG. 1.—Corn of a single variety (Leaming Dent) grown in two plots: at the left spaced far apart in hills, at the right crowded. The former grows to its full potential height, the latter is stunted. The size differences in the two plots are due to differences in environment, the heredity being the same. Plants are much more susceptible to nutritional influences on size than are mammals, but to a less degree nutrition has a similar effect on man. Photograph from A. F. Blakeslee.

THE EFFECT OF NUTRURE IN CHANGING NATURE

happen to be born two at a time, because two ova have developed simultaneously. The fact that they were born at the same time does not make them alike. They differ from each other as ordinary brothers and sisters do. Identical twins have their origin in a different phenomenon. They are believed to be halves of the same egg-cell, in which two growing points appeared at a very early embryonic stage, each of these developing into a separate individual. As would be expected, these identical twins are always of the same sex, and extremely like each other, so that sometimes their own mother can not tell them apart. This likeness extends to all sorts of traits:—they have lost their milk teeth on the same day in one case, in another they fell ill on the same day with the same disease, even though they were in different cities.

Now Galton reasoned that if environment really changes the inborn character, then these identical twins, who start life as halves of the same whole, ought to become more unlike if they were brought up apart; and as they grew older and moved into different spheres of activity, they ought to become measurably dissimilar. On the other hand, ordinary twins, who start dissimilar, ought to become more alike when brought up in the same family, on the same diet, among the same friends, with the same education. If the course of years shows that identical twins remain substantially alike and ordinary twins nearly as unlike as before, in spite of changes in conditions, then environment will have failed to demonstrate that it has any great power to modify one's inborn nature in these traits.

Data can be sought either by taking the general life history of the twins (Galton's method) or by applying standard tests to them, as most of his successors have done. There is a necessary margin of error in either case.

In the first place, even identical twins do not have exactly the same inborn equipment. Apparently they represent the right and left hand components of what, if kept together, would have been one individual. If the separation took place

at a very early period in the development of the embryo, they resemble each other closely. If, however, it took place some days later, when the normal differentiation between right and left halves of the individual was more advanced, then they differ more in adult life. Finally, the twins who did not separate completely,—the conjoined or “Siamese” twins,—are less alike than ordinary identical twins, because in their cases the separation began still later and could not be completed.

In the second place, the mental tests available are not precise. The correlation between identical twins is usually about as high as that of one individual taking the test at intervals of a year or so. This probably represents the validity of the test, more than it does the variability of the twins.

In the third place, even if they are identical, and have as nearly as possible the same genetic constitution, some effect is necessarily produced by extraneous influences. The first born of the pair may have the harder experience at birth and suffer more from injury than the one who follows after the way has been opened for him. They may have been nourished unequally in the uterus. They may suffer differently from childhood diseases. An infection occurring in one of them at puberty may delay the progress of maturity and thereby influence the personality permanently. Again, they may make desperate efforts to be unlike, in order to emphasize their own individuality, and thus present superficial appearances of dissimilarity. Finally, cases are on record where identical twins, apparently with almost identical genetic constitutions, have had very different careers because one of them married a strong-willed wife who overruled him at every turn and impressed on his history her own tendencies, in place of those with which he and his twin were born.<sup>90</sup>

Exaggerated hopes that application of standard tests might give highly exact measures of the respective contributions of nature and nurture, were therefore doomed to disappointment in the nature of things. But the results of the life histories and of tests have, in general, agreed in showing the trend, and in

emphasizing the fact that surroundings and training can not be depended upon to overcome the differences of inheritance. Identical twins who are 15 years old are, on the average, in any one trait scarcely more alike than those who are 5 years old, even in the subjects on which the schools have for 10 years directed all their efforts. Moreover, they are much more alike than are non-identical twins, although the surroundings can not be much different in the two cases,—indeed, when the fraternal twins are of the same sex, the parents may not know whether they are identical or not in origin; but the results of the tests disclose the facts plainly.

The study of twins at Yale<sup>44</sup> has been quoted frequently in the literature, because it made use of an excellent technique, taking one of a pair of identical twins for experiment and the other as a control. For six weeks one of a pair of small girls (a little less than a year old) was intensively trained in stair-climbing and in gaining coordination by playing with blocks, while her co-twin was prevented from doing either of these things. Later the co-twin was given the same training, to see whether she then did as well as her sister who had had so much longer and earlier practice. The same sort of training was then given to them in the acquisition of language (building up vocabulary).

Observations showed that the behavior patterns set by nature in the twins would develop in the normal way at the normal time, and that no amount of training made any particular difference in the long run. Progressive growth in function was almost identical in the two subjects—the one who had been drilled so intensively and the one who had been kept from participation.

The conclusion was that foreshadowed in the early pages of this chapter. Ability developed at the time it was intended by nature to develop, without much regard to special training; and it developed to the extent that it was intended by nature to develop. Special efforts to increase it did not produce any marked permanent result.



Histories<sup>99</sup> of 30 pairs of twins reported by J. Lange have attracted particular attention, because they dealt with a trait that has often been assumed to have little hereditary basis, namely, criminality. In each case, one of the pair had been imprisoned, and his co-twin was then followed up to see how nearly the careers of the pair were parallel. Of the 13 pairs diagnosed as identical twins, the histories were strikingly similar. In only three instances had the co-twin not also been convicted of crime. Among the ordinary twins, on the other hand, there was quite a different story to tell. In 15 out of the 17 instances the co-twin had no criminal record. Since the environment of the two types of twins is not markedly dissimilar in most cases, the conclusion was that even in regard to criminality, heredity is a strong predisposing factor.

The evidence from the study of adoption and of twins is the most satisfactory evidence available, to test the widespread belief that good care will eradicate inherited differences in endowment. It gives no warrant for this popular optimism, but shows rather that the inherited differences of endowment are powerful factors in producing the differences of achievement in later life.

*This critical evidence allows the successful interpretation of many other types of investigation, which fall into line with expectation. Thus there is a widespread belief on the part of parents and teachers that intelligence in children is closely related to physical defects, and that improvement of general health, correction of malnutrition, removal of infected tonsils, and the like are important means of improving the child's school work as well as general behavior.*

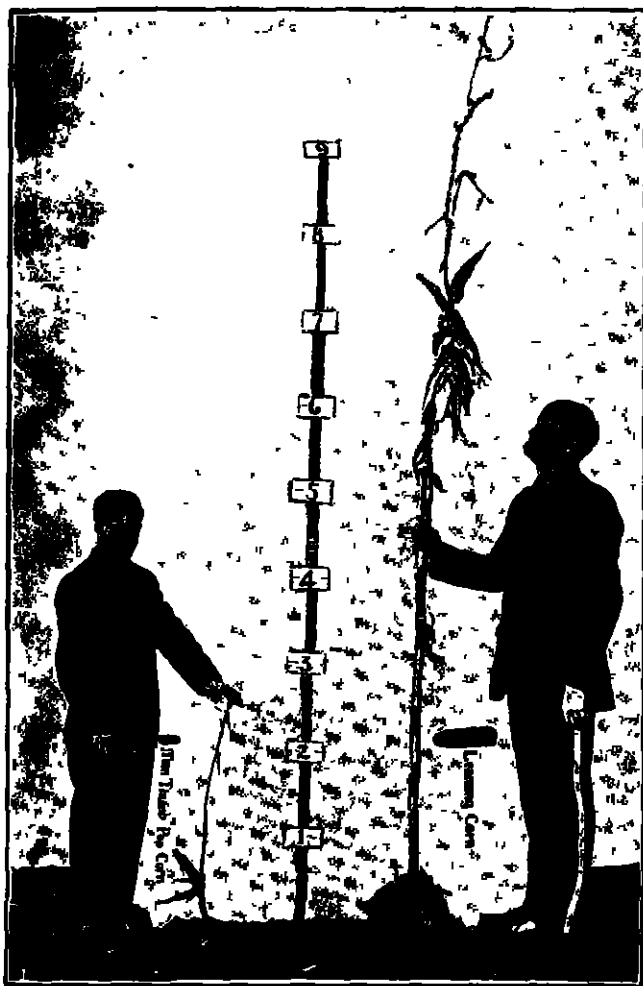
There is an association between mental deficiency and physical defects, as is pointed out in Chapter III, but this is due largely to the fact that both types of defect are the outcome of the same unfavorable genetic constitution. In the commoner type of case, some careful studies have shown surprisingly little association between external conditions and the child's condition, whether physical or mental<sup>103, 108</sup>

This is true, for instance, in cases of malnutrition as noted during the war. A comparison of English children born in 1914 with those born in 1915 and 1918 (bad war years) showed no falling off in height or weight among the latter; not even among 192 children of unmarried mothers, whose economic condition was particularly hard. Again 8,000 school children in Vancouver, B.C., were divided <sup>65</sup> into two groups, the well nourished and the poorly nourished. The amount of infection in each group was practically the same for all the acute infectious diseases: scarlet fever, diphtheria, measles, whooping cough, mumps, chicken pox, and smallpox.

Similarly 404 school children in Manitowoc, Wis., were divided into three groups. Group A included children not in need of medical attention, Group B those who needed immediate medical attention, Group C those with minor defects. There were no important differences between the three groups, either in intelligence scores or in school achievement. Retests later showed that those who had been found to need medical attention, and who had then been given such attention, had not improved their standing in other respects.

The extreme conditions of malnutrition experienced by German children during the war did not affect their I.Q.'s in 95% of the cases studied<sup>7</sup>; nor does such a profound and far-reaching physical change as precocious puberty <sup>146</sup> setting in at the age of six or eight. A long series of researches shows little relation between thyroid difficulties and intelligence, or bad tonsils and intelligence, <sup>129</sup> or adenoids and intelligence,<sup>66</sup> or even such a thoroughgoing physical impairment as hookworm infestation, and intelligence.<sup>120</sup> Diseases of the central nervous system are naturally more serious <sup>128</sup>; but congenital syphilis seems to have little effect on intellectual capacity.<sup>26</sup>

The evidence is now overwhelming, in short, that the various types of physical disability found among school children are not, within wide limits, factors in creating differences of intellectual capacity or school achievement. Good health is desirable for many reasons, but the frequent plea that correction



HEIGHT IN CORN AND MEN

FIG. 2—An unusually short and an unusually tall man, photographed beside extreme varieties of corn which, like these men, owe their differences in height indisputably to heredity rather than to environment. No imaginable environmental differences could reverse the positions of these two men, or of these two varieties of corn, the heredity in each case being what it is. The large one might be stunted, but the small one could not be made much larger. Photograph from A. F. Blakeslee.

of physical disabilities will turn dullards into bright children is wholly unwarranted, unless perhaps in special cases such as defects of eyesight and hearing.

In the light of the studies of adopted children and of twins, the distribution of success in life can also be understood more readily. If the kind of success that is due to great mental and moral superiority is due to the opportunities a man has, then it ought to be pretty evenly distributed among all persons who have had favorable opportunities, provided a large enough number of persons be taken to allow the laws of probability full play <sup>145</sup> England offers a good field to investigate this point, because Oxford and Cambridge, her two great universities, turn out most of the eminent men of the country, or at least have done so until recently. If nothing more is necessary to insure a youth's success than to give him a first-class education and the chance to associate with superior people, then the prizes of life ought to be pretty evenly distributed among the graduates of the two universities, during a period of a century or two.

This is not the case. When one looks at the history of England, as Galton did nearly half a century ago, one finds success in life to an unexpected degree to be a family affair. The distinguished father is likely to have a distinguished son, while the son of two "nobodies" has a relatively small chance of becoming distinguished. To cite one concrete case, Galton found that the son of a distinguished judge had about one chance in four of becoming himself distinguished, while the son of a man picked out at random from the population had about one chance in 4,000 of becoming similarly distinguished.

The objection at once occurs that perhaps social opportunities might play the predominant part; that the son of an obscure man never gets a chance, while the son of a prominent man is pushed forward regardless of his inherent abilities. This, as Galton argued at length, can not be true of men of really eminent attainments. The true genius, he thought, frequently succeeds in rising despite great obstacles, while no amount of

family pull will succeed in making a mediocrity into a genius, although it may land him in some high and very comfortable official position. Galton found a good illustration in the papacy, where during many centuries it was the custom for a pope to adopt one of his nephews as a son, and push him forward in every way. If opportunity were all that is required, these adopted sons ought to have reached eminence as often as a real son would have done, but statistics show that they reached eminence only as often as would be expected for nephews of great men, whose chance is notably less, of course, than that of sons of great men, in whom the rôle of heredity is much greater.

Transfer the inquiry to America, and it becomes even more conclusive, for this is supposed to be the country of equal opportunities, where it is a popular tradition that every boy has a chance to become president. Success is in some degree a family affair in caste-ridden England; is it possible that the past history of the United States shows the same state of affairs?

Galton found that about half of the great men of England had distinguished close relatives. If the great men of America have fewer distinguished relatives, environment will be able to make out a plausible case, it will be evident that in this continent of boundless opportunities the boy with ambition and energy gets to the top, and that this ambition and energy do not depend on the kind of family he comes from.

Frederick Adams Woods has made precisely this investigation.<sup>108</sup> The first step was to find out how many eminent men there are in American history. Biographical dictionaries list about 3,500, and this number provides a sufficiently unbiased standard from which to work. Now, Dr. Woods says, if we suppose the average person to have as many as twenty close relatives—as near as an uncle or a grandson—then computation shows that only one person in 500 in the United States has a chance to be a near relative of one of the 3,500 eminent men—provided it is purely a matter of chance. As a fact, the 3,500

eminent men listed by the biographical dictionaries are related to each other not as one in 500, but as one in five. If the more celebrated men alone be considered, it is found that the percentage increases so that about one in three of them has a close relative who is also distinguished. This ratio increases to more than one in two when the families of the forty-six Americans in the Hall of Fame are made the basis of study. If all the eminent relations of those in the Hall of Fame are counted, they average more than one apiece. Therefore, they are from five hundred to a thousand times as much related to distinguished people as the ordinary mortal is.

To look at it from another point of view, something like 1% of the population of the country is as likely to produce a man of genius as is all the rest of the population put together,—the other 99%.

*This might still be due in some degree to family influence, to the prestige of a famous name, or to educational advantages afforded the sons of successful men.* Dr. Woods' study of the royal families of Europe is more decisive.<sup>167</sup>

In royal families, the environment must on the whole have been uniformly favorable. It has varied, naturally, in each case, but speaking broadly it is certain that all the members of this group have had the advantage of unusual care and attention and of a good education. If such factors affect achievement, then the achievements of this class ought to be pretty generally distributed among the whole class. If opportunity is the cause of a man's success, then most of the members of this class ought to have succeeded, because to every one of royal blood, the door of opportunity usually stands open. One would expect the heir to the throne to show a better record than his younger brothers, however, because his opportunity to distinguish himself is naturally greater. This last point will be discussed first.

Dr. Woods in his study divided all the individuals into ten classes for intellect and ten for morality, those most deficient in the qualities being put in class I, while the men and women

of preëminent intellectual and moral worth were put in class X. If preëminent intellect and morality were at all linked with the better chances that an heir to the throne has, then heirs to the throne ought, in proportion to their actual numbers, to be more plentiful in the higher grades than in the lower. Actual count shows this not to be the case. A slightly larger percentage of inheritors is rather to be found in the lower grades. The younger sons have made just as good a showing as the

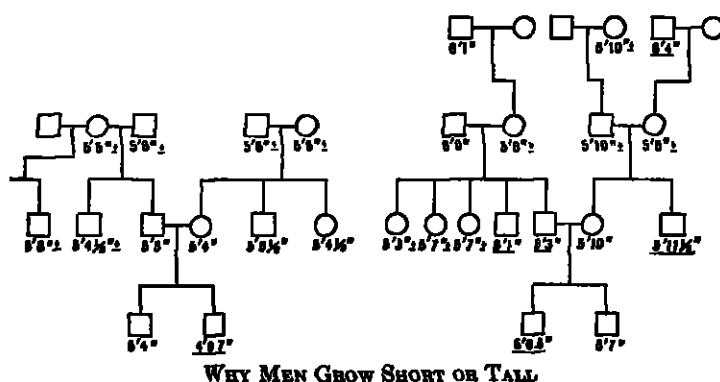


FIG. 3.—Pedigree charts of the two men shown in the preceding illustration. Squares represent men and circles women; figures underlined denote measurement in stocking feet. It is obvious from a comparison of the ancestry of the two men that the short one comes from a predominantly short family, while the tall one gains his height likewise from heredity. The shortest individual in the right-hand chart would have been accounted tall in the family represented on the left. After A. F. Blakeslee.

sons who succeeded to power; as one would expect if intellect and morality are due largely to heredity, but as one would not expect if intellect and morality are due largely to outward circumstances.

Are "conditions of turmoil, stress and adversity" strong forces in the production of great men, as has often been claimed? There is no evidence from facts to support that view. In the case of a few great commanders, the times seemed particularly favorable. Napoleon, for example, could hardly have been Napoleon had it not been for the French revolution. But in

general there have been wars going on during the whole period of modern European history; there have always been opportunities for a royal hero to make his appearance, but often the country has called for many years in vain. Striking examples are found in Spain and Italy. The upshot of it all, Dr. Woods decided, is that environment does not adequately explain differences in intellectual achievement.

Despite the good environment almost uniformly present, the geniuses in royalty are not scattered over the surface of the pedigree chart, but form isolated little groups of closely related individuals. One centers in Frederick the Great, another in Queen Isabella of Spain, a third in William the Silent, and a fourth in Gustavus Adolphus. Furthermore, the royal personages who are conspicuously low in intellect and morality are similarly grouped. Careful study of the circumstances shows nothing in the environment that would produce this grouping of genius, while it is exactly what a knowledge of heredity leads one to expect.

In the next place, do the superior members of royalty have proportionately more superior individuals among their close relatives, as was found to be the case among the Americans in the Hall of Fame? A count shows at once that they do. The first six grades all have about an equal number of eminent relatives, but grade 7 has more while grade 8 has more than grade 7, and the geniuses of grade 10 have the highest proportion of near relatives of their own character. Surely it can not be supposed that a relative of a king in grade 8 has on the average a much less favorable environment than a relative of a king in grade 10. Is it not fair, then, to assume that this relative's greater endowment in the latter case is due to heredity?

Conditions are the same, whether males or females be considered. The royal families of Europe offer a test case because for them the environment is almost uniformly favorable. A study of them shows great mental and moral differences between them, and critical evidence indicates that these differences are largely due to differences in heredity. Differences of



opportunity do not appear to be largely responsible for the achievements of the individuals.

But, it is sometimes objected, opportunity certainly is responsible for the appearance of much talent that would otherwise never appear. Take the great increase in the number of scientific men in Germany during the last half century, for example. It can not be pretended that this is due to an increased birth-rate of such talent; it means that the growth of an appreciation of scientific work has produced an increased amount of scientific talent. J. McKeen Cattell has argued this point most carefully in his study of the families of one thousand American men of science. "A Darwin born in China in 1809," he says, "could not have become a Darwin, nor could a Lincoln born here on the same day have become a Lincoln had there been no Civil War. If the two infants had been exchanged there would have been no Darwin in America and no Lincoln in England." And so he continues, urging that in the production of scientific men, at least, education is more important than eugenics.

This line of argument contains a great deal of obvious truth, but is subject to a somewhat obvious objection, if it is pushed too far. It is certainly true that the exact field in which a man's activities will find play is largely determined by his surroundings and education. Young men in the United States are now becoming lawyers or men of science, who would have become ministers had they been born a century earlier. But this environmental influence seems to us a minor one, for the man who is highly gifted in some one line is usually gifted more than the average in many other lines. Opportunity decides in just what field his life work lies; but he would be able to make a success in a number of fields. Darwin born in America would probably not have become the Darwin known to history, but it is not to be supposed that he would have died a "mute, inglorious Milton": it is not likely that he would have failed to make his mark in some line of human activity. Dr. Cattell's argument, then, while admissible, can not properly be urged against the

fact that outstanding ability is mainly dependent on inheritance.

As a matter of social justice, equality of opportunity is highly desirable. This should not be taken wrongly to mean, for instance, that every boy should have an equal opportunity to enter an engineering college. That is a privilege which should be available only to those who can show promise of profiting thereby. There should be an equality of opportunity for every boy to be tested as to his fitness for entering an engineering school. Entrance itself should be on the basis of what is appropriate, rather than what is equal. Appropriate opportunities for all are therefore to be sought rather than a metaphysical equality. *No matter how widely the opportunities are thrown open, equality of achievement will not result.* Giving every one the same opportunity is likely to increase rather than decrease the differences between personal achievements, because some are inherently so much more capable of profiting by a given opportunity than are others.

Nature and nurture are indissolubly associated in the achievements of every man and woman. Their effects can be separated out to a certain extent for study, but in daily life they are interdependent. The goal of society should be to provide its members with the best of each.

## CHAPTER II

### MODIFICATION OF THE GENES

*That the state of a man's health, his educational acquirements, and the vicissitudes he undergoes, will in some way affect the germinal \* character of his children, is an idea that is widely accepted without being analyzed. Most of those who hold it scarcely realize that they do hold it. But it is implicit behind most programs for the reform of institutions and for the improvement of surroundings.*

If it were possible thus to improve the race, merely by improving the conditions of existence, the course of eugenics would be plain and simple. The possibilities in this direction must therefore be investigated carefully, before any other program is proposed. Different types of influence, to which people are subjected, must be studied to see whether they have any tendency to affect the germinal traits of offspring of those people.

The whole question is sometimes begged by pointing out that the germ-cells are a part of the body, that anything which influences the whole body must influence that part represented by the germ-cells, and that these are, therefore, subject continually to influences which will modify the character of the offspring.

The premise may be granted readily, but the conclusion deserves scrutiny. It is evident that anything which affects the whole body,—climate, food, disease, or poison,—might affect the germ-cells. What is not so evident is that this effect should produce a definite change of a predetermined sort.

\*The words *inborn*, *innate*, *inherent*, *congenital*, and *intrinsic* might well be discarded, in eugenic discussions, in favor of some such word as *germinal* or *genetic*. This would show that the thought goes back to the individual at the moment of conception, rather than at the moment of birth. Conception represents the dividing line between eugenics and eutonics.

Granted that overstudy may lead to eyestrain, that eyestrain may damage the eyes, that damage to the eyes may result in damage to the whole body, and that such damage will include damage to the germ-cells, the question is: how can this particular damage to germ-cells, if it actually occurs, be expected to produce such a specific change in them that the next generation will be born with weakened vision? Why might it not just as likely, if it produced a change at all, result in offspring with weakened lungs or hearts or kidneys?

When one recalls the small start that any person has, and the great changes that take place between his start and his finish, the attempt to trace this type of a change from one generation to the other seems puerile. The child begins with the union of two cells, both extraordinarily small. The egg-cells which went to produce all the living inhabitants of the globe could have been contained in a 2-gallon jar; the sperm-cells which united with them to produce all the living inhabitants of the globe could have been stacked on a large pinhead.

Starting from such a tiny speck of protoplasm, the individual has developed through an indescribably complex series of physical and chemical reactions, until he appears in the world as somebody's baby. Considering this developmental history, the idea that exercise which enlarges the blacksmith's arm could in some way affect his germ-cells so that his offspring, in turn, would be born with enlarged biceps, seems merely naïve.

More detailed consideration of alleged types of change reveals that the evidence is decisively adverse.

1. Mutilations may be ruled out at once. The man whose arm has been amputated in childhood finds that his children are born with arms just as good as those of the neighbors' boys.

Long-continued repetition of the mutilation does not produce cumulative effects. Cutting off the legs or tails of mice for generation after generation does not alter the normal proportions of their descendants. The carefully planned laboratory experiments which have been performed to test this point during the last half century were scarcely needed, in view of those

which are observable by anyone. Some tribes have pierced ears or noses for unnumbered centuries. Other races have practiced circumcision for several thousand years. Foot-binding and head-binding can be followed through many generations. None of these practices has yet led to an observable alteration in the offspring.

Occasional coincidences can be interpreted along more reasonable lines. Thus a story has gone the rounds of various books



BOUND FOOT OF A CHINESE WOMAN

FIG. 4.—For centuries the feet of upper-class women, and of many lower-class women, in China were distorted in this manner, but their daughters had perfect feet when born.

In the United States for half a century, of a cat whose tail was caught in a door and broken. It was thereafter crooked. The kittens later borne by this cat had, in some cases, crooked tails. It happens that a gene which produces a kink in the vertebrae of the tail is fairly common among cats, particularly in Siam, where some of the most highly prized domestic cats originate. Siamese cats regularly have crooked tails, in some families. Undoubtedly the ancestry of the cat mentioned above contained this particular gene, which produced its normal result, and the coincidence of an accident was sufficient to start a nursery story.

2. The effect of diseases is more indirect, and less easy to dismiss offhand. It is often said that the Negroes of West Africa, by long exposure to malaria, have gradually acquired, or have come to inherit, high resistance. "As a result of long racial experience, Negro babies are now born relatively immune to malaria" The relative immunity is a fact. The explanation is simple. In each generation there is a wide natural variation among the members of a group, in this or in almost any other respect. Some are born relatively immune, some have low resistance. In a region such as West Africa, where malaria has long been endemic, the chance of infection is universal. Those with weak resistance die early, and leave few or no children. Those born with the strongest natural resistance are most likely to survive and to leave children to inherit, to some extent at least, their high resistance. The race thus becomes a little more resistant to malaria in each generation. But this is the result of natural selection, not of any direct effect of malaria on the germ-cells.

3. The results of use and disuse, of habit and training, have been one of the main subjects of controversy among evolutionists for a century or more.

The French zoölogist J. B. Lamarck published in 1809 his theory of evolution, based on the supposition that the form of an animal was modified by its function, and that this modification was inherited. The stock example is his citation of the giraffe, which by continually stretching its head upward to reach higher leaves of trees, has succeeded in becoming the long-necked monstrosity that it is today. This is an illustration of a supposedly acquired character, and the doctrine of evolution by that method is often described as "the inheritance of acquired characters" or, in a word, as Lamarckism. The idea was accepted without much criticism by Charles Darwin and his contemporaries, and seemed a matter of course until challenged by the German zoölogist, August Weismann, who showed that the evidence in favor of it was mostly imaginary or better explained in other ways and that there was strong evidence against it.

Since Weismann's day, the Lamarckian view, that what an animal does is passed on as changed inheritance to his offspring, has generally been abandoned by men of science, though not by the public and by pseudo-scientists. Its persistence is apparently due to an emotional quality in man, which makes him desire to think that his own achievements will directly benefit his posterity.

The contrary idea has often been stigmatized as pessimistic and as likely to discourage people from improving their condition. This type of criticism at once reveals the emotional bias in this instance behind the "will to believe." It has often been pointed out, on the other hand, that in view of the mistakes all people make and the imperfect character of civilization, it would be a doctrine of despair to hold that children in this direct way must suffer for the sins of their fathers.

The question is not to be decided by sentimental predilection, however, but by an appeal to the observed facts. These have been analyzed at great length during recent years, and without exception have been found explicable on other grounds than an appeal to any power of the organism to respond to changed conditions by a change in the germ-cells.

Carefully planned experiments have also been made. One of these which was heralded widely for a few years was ascribed to the Russian physiologist, I. P. Pavlov. He conditioned the reflexes of mice by ringing a bell just before feeding them. They thus came to associate the bell with food, and after 300 lessons would run to the front of the cage when the bell was rung, because they knew it meant food for them. Their descendants were trained the same way, and Professor Pavlov asserted that in the next generation no more than 100 lessons were needed, in the third 30, and in the fourth only 5, to get all the mice born to run to the front of the cage when they heard the bell. Such a result was so unreasonable that only the high scientific standing of Professor Pavlov caused it to receive attention. It was at once repeated by several others (E. C. MacDowell with rats, E. M. Vicari with mice, H. J. Bragg with

albino mice). None of them found any such result as had been described. Suddenly Professor Pavlov began to inform visitors to his laboratory that he had made a mistake,—that the whole thing was an error. There is still some mystery about just what happened, but at least this is no longer quoted as evidence of "the inheritance of acquired characters."

Other experiments have been carried out under the most careful conditions, and have given negative results. They will be found described in contemporary scientific journals. The only possible exception to date is one<sup>28</sup> conducted by the psychologist, W. McDougall, who trained rats by putting them in a tank of water. They swam about aimlessly and tried to get out at two possible landings. One of these, which was dark, gave them egress, the other, which was illuminated, simply gave them an electric shock. After some months of training at least the more responsive rats had learned that one landing produced no result except an electric shock, and when put in the water they would swim directly and confidently to the safe landing. Their offspring were put through a similar process, and this continued for a score of generations. Professor McDougall believes that their training was inherited, so that their descendants learned how to avoid the shock and to make a safe exit, more easily than did the first generation.

It is axiomatic in research that an experiment amounts to nothing unless it can be repeated by others who obtain the same results described by the originator. This experiment was repeated by F. A. E. Crew, who did not get the results that were achieved by Professor McDougall. A number of explanations for the latter's results are possible: he may have unconsciously selected the most alert individuals when the first animals coming to the cage door were picked out for training; there may have been a communication of the facts by the rats to each other, variations in the strength of the shock employed may have confused the results; and there may have been a favorable selection of animals from generation to generation, as evidenced by elimination of weaklings, elimination of poor



est learners by shocks which disabled them, and the elimination of many trained animals from representation by trained progeny. Such difficulties of interpretation suggest the care which must be exercised, before the results of any one experiment can be accepted as settling so important an issue.

Many unsatisfactory ways of dealing with the evidence of evolution have been demonstrated during the last century, but doubtless the worst is the expedient of changing names and supposing that one has explained a process simply by giving a new name to it. Thus the novelist, Samuel Butler, asserted that heredity was simply a form of memory,—racial memory. The descendants were able to do things that their ancestors had learned to do, because they “remembered” the process. Mr. Butler became very peevish because men of science did not recognize that he had solved the problem of ages. But is anything more known about the process in question, by describing it in a word spelled “memory,” than by describing it with a word spelled “heredity”? In either case the problem is not to give it a name, but to find a mechanism capable of producing the observed results.

This fruitless procedure was revived in the first decade of the present century by a talented zoologist, Richard Semon, who not only proposed to explain heredity by calling it memory, but invented a purely imaginary mechanism of “mnemes” and “engrams” to show how it worked. He attracted attention because of his zoological attainments, but before his death by suicide in 1918 it was generally recognized that he had again made no more of a scientific contribution to the problem than to change the spelling of the words.

Most cases supposed to show the effects of use and disuse can be explained as actually the result of differential selection, either natural or artificial. A stock illustration is the blind cave fish.<sup>114</sup> Living in a dark cavern, he did not use his eyes, and in each generation the cumulative effects of this disuse were inherited, it is alleged, until his eyesight, and his eyes too, had disappeared. Such an explanation is fanciful, in the absence

of any mechanism to explain it. But it can easily be brought into line with known mechanisms. Defective mutations that affect the eye are occurring from time to time. If eyesight is a necessity for survival, these defective mutant genes are quickly weeded out by the death of their possessor. But in the cave eyesight is useless, hence the defectives are not penalized, but continue to live and to propagate, until these eye defects have been spread, have accumulated, and the fish are left blind after a large enough number of generations. Add to this the important fact that most such caves have some sort of ingress or egress, that fish with good eyesight go to this source of light and swim out, thus leaving the cave to the ones with bad eyesight, and it is easy to see that after a while the fish in the cave will be fish with defective eyes.

4. A fourth category may be called the physico-chemical effects of the environment. This takes in cases where changes over a long period of time are ascribed to the temperature or climate, or to chemical substances such as ethyl alcohol.

In an earlier day it was natural to ascribe the dark skins of tropical races to long generations of exposure to sunburn. In each generation the offspring inherited a little more sunburn, until they ultimately became brown or black. It is just as easy, and much more reasonable, to suppose that there would be a variety of skin color in each generation and that, if pigment were a protection, those who had it were likely to have better health, be longer lived, and pass on some of their peculiarity to their offspring. In this field, again, the carefully controlled experiments made in abundance have resulted negatively. Some that were exploited in their day failed to stand examination.

The best known of these are due to the Austrian zoologist, Paul Kammerer. During a decade or more he published a series of papers showing how he had marvelously changed the offspring of animals by subjecting them to changed conditions of heat, moisture, and the like.

One of the most talked-about of his experiments concerned

the Midwife Toad, so called because the male helps the female to lay her eggs. This animal lives on dry land. By forcing it into the water, Kammerer changed its habits of life and, so he said, made nuptial pads appear on its fore-paws—thickenings of the skin which are associated with the mating season in other species that inhabit the water. When a second generation was produced, this time on dry land again, Kammerer claimed that the nuptial pad still was present. Critics did not hesitate to ask why only photographs of this experiment were shown, and the original material not produced. Finally an American specialist was visiting the Institute in Vienna where Kammerer worked, in the latter's absence. The director of the Institute called for Kam-



DEFECTIVE LITTLE TOE OF A PREHISTORIC  
EGYPTIAN

FIG. 5 —The above illustration shows the foot of a prehistoric Egyptian who is estimated to have lived about 8,000 B. C. The last joint of the little toe is lacking, and careful dissection leaves no doubt that its suppression was the result of a germinal abnormality, such as is common at the present time, and not the result of disease. Evidently the degeneration of man's little toe must be ascribed to some more natural cause than the wearing of tight shoes. Photograph from Dr. Gorgy Sobhy, School of Medicine, Cairo.

merer's material; investigation quickly revealed to the visitor that the nuptial pad which was supposed to represent the "inheritance of acquired characteristics" had in fact been produced by injecting India ink under the skin.

When the fact was published, Kammerer went up on a hill outside of Vienna and blew out his brains. He had just previously been given a position in Moscow, where the Soviet government had looked forward hopefully to having him prove that better economic conditions were the only key to permanent race betterment.

In a very different class are the experiments of M. F. Guyer, who ground up the lens of a rabbit's eye, and injected the material into living rabbits. When these produced young, some of the latter had defective eyes. This was thought to be the result of chemical shock to the germ-cells, produced by injecting the pulped lens. This work is still being carried on. It was repeated, using Dr. Guyer's exact methods, by G. F. Finlay, J. S. Huxley, and A. M. Carr-Saunders, who got no results whatever. Since rabbits often have defective eyes anyhow, it seems likely that the strain with which Dr. Guyer worked was one that carried an inherited defect of this sort, and that the appearance of this defect in some of the offspring merely happened to coincide with the injection of pulped lens.

There is nothing inherently impossible about the production of a change in a gene, by the injection of chemical substances which, circulating in the blood, will reach the germ-cells. It is merely a question of observed fact,—does such a procedure produce an effect on the offspring, or does it not?

One of the substances most studied in this connection is alcohol. It has often been supposed that the children of alcoholic parents are "degenerate" because the alcohol acts as a "racial poison." Since studies of human families can be interpreted in different ways, the most satisfactory procedure has been to test the theory on laboratory mammals.

The experiment most often quoted is that of C. R. Stockard who subjected guinea-pigs to the fumes of alcohol, daily for

many months. He found in the untreated offspring of the treated males a variety of defects, even when the treated parents did not show any obvious damage.

The experiment has been repeated by F. M. Durham, who kept guinea-pigs intoxicated for six days out of seven, for years on end.<sup>33</sup> In this experiment as in that of Dr. Stockard, the animals were given a much heavier alcoholization than would ever be possible to human beings. Miss Durham, however, found no defects appearing in the offspring of the treated parents, and it seems probable, therefore, that the defects in Dr. Stockard's stock were there already,—that they were simply outgrowths of bad ancestry of those particular families

The guinea-pig experiments are thereby brought into line with other experimental work on mammals, which has shown that alcohol produced no specific effect on the germ-cells. The most careful study on albino rats<sup>56</sup> was made by intoxicating them daily except Sunday for 10 generations. In 1,688 animals some bad effects of alcohol were noted, especially in injury to the eyes. But when these animals were bred, their untreated offspring did not show the same defects. There was but one case of eye defect among their offspring, and this proved not to be hereditary, whereas in the control stock, whose parents had received no alcohol, two cases of defective eyes were produced.

No one questions the direct physiological damage of alcohol, but it appears that the most extreme amounts that can be administered to animals are not sufficient to cause mutations of their genes. *Evidently the latter are relatively stable. If it were not so, life on the earth might have become extinct millions of years ago.*

If gene mutations can not be produced in other mammals, it is highly improbable that they can be produced in man with much smaller dosage, particularly as mankind has been exposed to alcohol for thousands of years and some of the weaker strains have probably been killed off in each generation. The observed fact of physical and mental deterioration in alcoholic families

is, therefore, to be interpreted as meaning that they were defective to start with, and that alcoholism is simply one of the many symptoms of this defect.<sup>128</sup> Experimental evidence,<sup>68</sup> showing that a weak nervous system is most susceptible to alcohol, strengthens this interpretation.

Of the many other substances which have been supposed to produce germinal changes,<sup>40</sup> lead is the only one deserving serious consideration. The evidence is still inadequate to give a decision but it is entirely possible that lead may produce an effect on the germ-cells, as it does on the body-cells. Fortunately, human beings are not often exposed to the effects of lead, except in a few industries.

When one considers high-frequency radiation, the situation is much clearer. Both radium emanations and the X-ray have been found to provoke mutations in germ-cells of lower animals and of plants, and it can not be doubted that they may do the same in human beings.

The variability of all living things was accepted merely as an inherent property of life by Charles Darwin and his immediate successors. The Darwinian view of evolution was based on the supposition that all variations are inheritable. Then it became evident that this was not true. that much of the variability is a mere fluctuation. The causes of variability continued obscure until during the last few decades some light has been thrown on them. It is now evident that most of the variation is due merely to the sorting out of genes into new combinations (see the following chapter) and does not involve any actual change in a gene. It has also become apparent, however, that there are some changes, generally called mutations, which involve an actual change in the structure and in the effects of a gene. They are rare and by no means the major factor in evolution.

Since it has been found that these mutations can be produced by X-ray and radium, the question has naturally been put whether the appearance of mutations in nature is not due to the radio-activity of the earth, or to cosmic radiation. It

is too soon to say that the problem has been solved, but it is possible that the solution lies, in part, in this direction. The mutations or gene-changes provoked by X-rays are of the same sort as those that are occurring naturally. X-radiation simply increases the natural rate of mutation.

Mutations occur at random. If a gene producing one effect mutates, there is no tendency for genes producing similar effects to mutate with it. There is no tendency for several genes lying together in the chromosome to mutate at the same time. Nearly all of the mutations that occur are harmful to the organism. Few are useful. Possibly a much larger number is indifferent or neutral as to utility.

These facts rule out any possibility that radiation can be used to produce gene-changes in man that will be helpful to him. It can be said with a good deal of certainty that the effects of radiation can not be foretold, but are likely to be harmful.

Since some mutations that have been detected, from experiments with radiation, seem to behave as recessives, they will not appear at once in the offspring of treated persons. They may not, indeed, appear for many centuries, until such a recessive mutant meets another like itself.

Radiation of the reproductive organs of pregnant women has been found to produce a high percentage of mental and nervous defect in the offspring. Radiation on a non-pregnant woman has not been found to produce any harmful effects in children subsequently conceived and born.<sup>102</sup> But it seems probable, in the light of experiments with other animals, that harmful mutations will be thus initiated and passed on to posterity, to accumulate and come to light at some future time.

Eugenically, therefore, a woman should not be subjected to heavy radiation of the ovaries, either by radium or X-ray, if she is to bear children later. Radiation of other parts of the body will not have this effect, if the reproductive organs are properly protected. And in no case is the light use of X-ray for photography likely to prove injurious in this way.

Before leaving the discussion of possible changes in the genes, two superstitions require passing mention. These concern maternal impressions and telegony.

It was formerly thought, even by intelligent people, and is still believed by many uneducated persons, that the mother's thoughts, emotional attitudes, or experiences could produce an effect on the child in her womb. This might take the form of a general influence, as when a mother was instructed to hear music and gaze upon works of art during pregnancy, in order that her child might be born with artistic talents. It might also take the form of "marking," in which as a result of some fright or accident to the mother, the child was born marked in a corresponding way.

A hypothetical case of a common type may be cited for the sake of clearness. The mother receives a wound on the arm. When her child is born it is found to have a scar of some sort at about the same place on the corresponding arm. Few mothers would fail to see the result of a maternal impression here. But how could this mark have been transmitted? This is not a question of the transmission of acquired characters through the germ-plasm, or anything of that sort, for the child was already formed when the mother was injured. One is obliged, therefore, to believe that the injury was in some way transmitted through the placenta, the only connection between the mother and the unborn child, and that it was then reproduced in some way in the child.

Here is a situation which, examined in the cold light of reason, puts a heavy enough strain on the credulity. Such an influence can reach the embryo only through the blood of the mother. Is it conceivable to any rational human being that a scar, or what not, on the mother's body can be dissolved in her blood, pass through the placenta into the child's circulation, and then gather itself together into a definite scar on the infant's arm?

There is just as much reason to expect the child to grow to resemble the cow on whose milk it is fed after birth, as to ex-



pect it to grow to resemble its mother, because of prenatal influence, as the term is customarily used, for once development has begun, the child draws nothing more than nourishment (and rarely some noxious substance) in the blood from its mother.

To examine the circumstances more closely, one should inquire about the time element. Immediately arises the significant fact that most of the marks, deformities, and other effects which are credited to prenatal influence must on this hypothesis take place at a comparatively late period in the antenatal life of the child. The mother is frightened by a dog, the child is born with a dog-face. Ask when her fright occurred, and one usually finds that it was not earlier than the third month, more likely somewhere near the sixth.

But it ought to be well known that all the main parts of the body have been differentiated in the embryo at the end of the second month. At that time, the mother rarely more than suspects the coming of the child, and events which she believes to "mark" the child usually occur after the fourth or fifth month, when the child is substantially formed, and it is impossible that many of the effects supposed to occur could actually occur. Indeed, it is now believed that most errors of development, such as lead to the production of great physical defects, are due to some cause within the embryo itself, and that most of them take place in the first three or four weeks, when the mother is by no means likely to influence the course of embryological development by her mental attitude toward it, for the very good reason that she knows nothing about it. Unless she is immured or isolated from the world, nearly every expectant mother sees many sights of the kind that, according to popular tradition, cause "marks." Why is it that the results are so few? Why is it that women doctors and nurses, who are constantly exposed to unpleasant sights, have children that do not differ from those of other mothers?

Darwin, who knew how to think scientifically, saw that this is the logical line of proof or disproof. When Sir Joseph Hooker,

the botanist and geologist who was his closest friend, wrote of a supposed case of maternal impressions, one of his kinswomen having insisted that a mole which appeared on her child was the effect of fright upon herself for having, before the birth of the child, blotted with sepia Turner's *Liber Studiorum* that had been lent her with special injunctions to be careful, Darwin replied: "I should be very much obliged, if at any future or leisure time you could tell me on what you ground your doubtful belief in imagination of a mother affecting her offspring. I have attended to the several statements scattered about, but do not believe in more than accidental coincidences. W. Hunter told my father, then in a lying-in hospital, that in many thousand cases he had asked the mother, before her confinement, whether anything had affected her imagination, and recorded the answers; and absolutely not one case came right, though, when the child was anything remarkable, they afterwards made the cap to fit."

Any doctor who has handled many maternity cases can call to mind instances where every condition was present to perfection, for the production of maternal impression, on the time-honored lines. None occurred. Most mothers can, if they give the matter careful consideration, duplicate this experience from their own. Why is it that results in infant markings are so rare?

That Darwin gave the true explanation of a great many of the alleged cases is perfectly clear. When the child is born with any peculiar characteristic, the mother hunts for some experience in the preceding months that might explain it. If she succeeds in finding any experience of her own at all resembling in its effects the effect which the infant shows, she considers she has proved causation, has established a good case of prenatal influence.

It is not causation; it is coincidence.

If the prospective mother plays or sings a great deal, with the idea of giving her child a musical endowment, and the child actually turns out to have musical talent, the mother at once

recalls her yearning that such might be the case, and her assiduous practice which she hoped would be of benefit to her child. She immediately decides that it did benefit him, and she becomes a convinced witness to the belief in prenatal culture. Has she not herself demonstrated it?

She has not. But if she would examine the child's heredity, she would probably find a taste for music running in the germ-plasm. Her study and practice had not the slightest effect on this hereditary disposition. It is equally certain that the child would have been born with a taste for music if its mother had devoted eight hours a day for nine months to cultivating thoughts of hatred for the musical profession and repugnance for everything that possesses rhythm, melody, or harmony.

It necessarily follows, then, that attempts to influence the inherent nature of the child, physically or mentally, through "prenatal culture," are doomed to disappointment. The child develops along the lines of the potentialities which existed in the two germ-cells that united to become its origin. The course of its development can not be changed in any specific way by any corresponding act or attitude of its mother. Good hygiene alone need be her concern.

It must necessarily follow that attempts to improve the race on a large scale, by the general adoption of prenatal culture as an instrument of eugenics, are useless.

Indeed, the logical implication of the teaching is the reverse of eugenic. It would give a woman reason to think she might marry a man whose heredity was most objectionable, and yet, by prenatal culture, save her children from paying the inevitable penalty of this weak heritage. The world has long shuddered over the future of the girl who marries a man to reform him; but think what it means to the future of the race if a superior girl, armed with correspondence school lessons in prenatal culture, marries a man to reform his children!

Those who practice this doctrine are doomed to disillusionment. The time they spend on prenatal culture is not cultivating the child; it is merely perpetuating a fallacy. Not only

is their time thus spent wasted, but worse, for they might have employed it in ways that really would have benefited the child—in open air exercise, for instance

To recapitulate, the facts are:

(1) That there is, before birth, no connection between mother and child, by which impressions on the mother's mind or body could be transmitted to the child's mind or body.

(2) That in most cases the marks or defects whose origin is attributed to maternal impression, must necessarily have been complete long before the incident occurred which the mother, after the child's birth, ascribes as the cause.

(3) That these phenomena usually are found when a supposed cause has happened and the result is looked for. The explanations are found after the event, and that is regarded as causation which is really coincidence.

Prenatal care as a eugenic measure is of course not only legitimate but urgent. The embryo derives its entire nourishment from the mother, and its development depends wholly on its supply of nourishment. Anything which affects the supply of nourishment will affect the embryo in a general, not a particular way. If the mother's mental and physical condition be good, the supply of nourishment to the embryo is likely to be good, and development will be normal. If, on the other hand, the mother is constantly harassed by fear and hatred, her physical health will suffer, she will be unable properly to nourish her developing offspring, and it may be that the child's poor physical condition when born will indicate this.

The other fallacy which deserves a passing word, although it is of more concern to the live-stock breeder than to the eugenicist, is called *telegony*. It is the belief that conception by a female results in a definite modification of her germ-plasm from the influence of the male, and that this modification will be shown in the offspring she may subsequently bear to a second male. The only case where it is often invoked in the human race is in miscegenation. A white woman has been married to a Negro, for instance, and has borne one or more mulatto off-

spring. Subsequently, she mates with a white man; but her children by him, instead of being pure white, it is alleged will also be mulattoes. The idea of *telegony*, the persistent influence of the first mating, is invoked to explain this discrepancy.

It is, however, a pure myth, as well as the corresponding belief that the male may carry a persistent effect in his germ-cells from a first mating. There is no good evidence to support *telegony*, and there is abundant evidence to contradict it. *Telegony* is still believed by many animal breeders, but it has no place in science. In such a case as the one quoted, the explanation is undoubtedly that the supposed father is not the real one. And this explanation will dispose of all other cases of *telegony* which can not be explained, as in most instances they can be, by the mixed nature of the ancestry, and the consequent variability.

In short, none of the influences to which mankind is ordinarily subjected, whether it be his own thoughts and exertions, climate, the effects of mutilation or other catastrophe, or the results of exposure to poisonous chemicals, seems to cause any definite change in his germ-cells. The effects of high-frequency radiation can be left out of account, since they are of an order that is not encountered in daily life.

If any changes are produced by the ordinary circumstances of life, they are so slow, so imperceptible, or so neutral that they may be ignored for the purposes of eugenics. If changes could be produced, it may be inferred that they would probably not be helpful, but harmful if not definitely fatal.

The seeker after a fundamental method of race betterment is therefore thrown back on variation of the germ-plasm. He can not take the inherited potentialities of men and women and "remould them nearer to the heart's desire." He must take them as they are, and his only chance of bringing about a radical change in the make-up of a future generation is to follow the method of nature, in which some types of people leave more offspring to perpetuate their characteristics, than

do other types. The physical determiners of these characteristics are the material with which the eugenist is chiefly concerned.

The stability of the genes, and the relatively small changes that occur in them from generation to generation and from century to century, make them objects of particular interest to the biologist. It was pointed out earlier in this chapter that the baby starts from such a small origin that he can be said to begin with nothing but genes. Whatever he is to become, is wrapped up in these genes. He may not make use of all the potentialities; but all the potentialities are there.

The body is thus the outgrowth of the genes; it is a shelter for the genes; it is a vehicle for passing on the genes to the next generation. The germ-cell, as the special part of the body whose genes are passed on, has a status all its own.

"Death is the end of life," is the belief of many persons other than Lotus Eaters. It is commonly supposed that everything which lives must eventually die. But study of a one-celled animal, an Infusorian, for example, reveals that when it reaches a certain age it pinches in two, and each half becomes an Infusorian in all appearance identical with the original cell. Has the parent cell then died? It may rather be said to survive, in two parts. Each of these daughter cells will in turn go through the same process of reproduction by simple fission, and the process will be continued in their descendants. The Infusorian can be called potentially immortal, because of this method of reproduction.

The immortality, as Weismann pointed out, is not of the kind attributed by the Greeks to their gods, who could not die because no wound could destroy them. On the contrary, the Infusorian is extremely fragile, and is dying by millions at every instant. But if circumstances are favorable, it can live on. It is not inevitably doomed to die sooner or later, as is Man. "It dies from accident often, from old age never."

Now the single-celled Infusorian is in many respects comparable with the single-celled germ of the higher animals. The

analogy has often been carried too far. Yet it remains indisputable that the germ-cells of man reproduce in the same way, by simple fission, as the Infusorian and other one-celled animals and plants, and that they are organized on much the same plan. Given favorable circumstances, the germ-cell should be expected to be equally immortal. Does it ever find these favorable circumstances?

The investigations of microscopists indicate that it does—that evolution has provided it with these favorable circumstances, in the bodies of the higher animals. Let us recall in outline the early history of the fertilized germ-cell, the zygote formed by the union of ovum and spermatozoon. These two unite to form a single cell, which is essentially the same, physiologically, as other germ-cells. It divides in two similar cells, these each divide, the resulting cells again divide, and so the process continues, until the whole body,—a fully developed man,—has been produced by division and redivision of the one zygote.

But the germ-cell is obviously different from most of the cells that make up the finished product, the body. The latter are highly differentiated and specialized for different functions—blood cells, nerve cells, bone cells, muscle cells, and so on, each a single cell but each adapted to do a certain work, for which the original, undifferentiated germ-cell was wholly unfit. It is evident that differentiation began to take place at some point in the series of divisions, that is to say, in the development of the embryo.

Th. Boveri, studying the development of a threadworm, made the interesting discovery that this differentiation began at the first division. Of the two daughter cells produced from the zygote, one continued dividing at a very slow rate, and without showing any specialization. Its "line of descent" produced only germ-cells. The products of division of the other daughter cell began to differentiate, and soon formed all the necessary kinds of cells to make up the body of the mature worm. In this body, the cells from the first daughter cell men-

tioned were inclosed, still undifferentiated. They formed the germ-cells of the next generation, and after maturity were ready to be ejected from the body, and to form new threadworms.

Imagine this process taking place through generation after generation of threadworms, and one will realize that the germ-plasm was passed on directly from one generation to the next; that in each generation it gave rise to body-plasm, but that it did not at any time lose its identity or continuity, a part of the germ-plasm being always set aside, undifferentiated, to be handed on to the next generation.

In the light of this example, one can better understand the definition of germ-plasm as "that part of the substance of the parents which does not die with them, but perpetuates itself in their offspring." By bringing his imagination into play, the reader will realize that there is no limit to the backward continuity of this germ-plasm in the threadworm. Granted that each species has arisen by evolution from some other, this germ-cell which is observed in the body of the threadworm must be regarded as part of what may well be called a stream of germ-plasm, that reaches back to the beginning of life in the world. It will be equally evident that there is no foreordained limit to the forward extension of the stream. It will continue in some branch, as long as there are any threadworms or descendants of threadworms in the world.

The reader may well express doubt as to whether what has been demonstrated for the threadworm can be demonstrated for the higher animals, including man. It must be admitted that in many of these animals conditions are too unfavorable, and the process of embryology too complicated, or too difficult to observe, to permit as distinct a demonstration of this continuity of the germ-plasm, wherever it is sought. But it has been demonstrated in a great many animals. No facts which impair the theory have been discovered. Biologists therefore feel perfectly justified in generalizing and in declaring the continuity of germ-plasm to be a law of the world of living things.



Focusing attention on its application to man, one sees that the race must represent an immense network of lines of descent, running back through a vast number of different forms of gradually diminishing specialization, until it comes to a point where all its threads merge in one knot—the single cell with which it may be supposed that life on this globe began. Each individual is not only figuratively, but in a very literal sense, the carrier of the heritage of the whole race—of the whole past, indeed. Each individual is temporarily the custodian of part of the “stuff of life” From an evolutionary point of view, he may be said to have been brought into existence, primarily to pass this sacred heritage on to the next generation. From nature’s standpoint, he is of little use in the world, his existence is scarcely justified, unless he faithfully discharges his trust, passing on to the future the “Lamp of Life” whose fire he has been created to guard for a short while.

Immortality, we may point out in passing, is thus no mere hope to the parent; it is a real possibility. The death of the huge agglomeration of highly specialized body-cells is a matter of little consequence, if the germ-plasm, with its power to reproduce not only these body-cells, but the mental traits—indeed, we may in a sense say the very soul—that inhabited them, has been passed on. The individual continues to live, in his offspring, just as the past lives in him. To the eugenist, life everlasting is something more than a figure of speech or a theological concept—it is as much a reality as the beat of the heart, the growth of muscles, or the activity of the mind.

This doctrine of the continuity of germ-plasm throws a fresh light on the nature of human relationship. It is evident that the son who resembles his father can not accurately be called a “chip off the old block.” Rather, they are both chips off the same block. And aside from bringing about the fusion of two distinct strains of germ-plasm, father and mother are no more responsible except in the choice of mate, for endowing the child with its characters, than is the child for “stamping his impress” on his parents. From another point of view, it has been said

that father and son ought to be thought of as half-brothers by two different mothers, each being the product of the same strain of paternal germ-plasm, but not of the same strain of maternal germ-plasm. Biologically, the father or mother should not be thought of as the producer of a child, but as the trustee of a stream of germ-plasm which produces a child whenever the proper conditions arise. Or as Sir Michael Foster put it, "The animal body is in reality a vehicle for ova or sperm; and after the life of the parent has become potentially renewed in the offspring, the body remains as a cast-off envelope whose future is but to die." Finally to quote the metaphor of J. Arthur Thomson, one may "think for a moment of a baker who has a very precious kind of leaven; he uses much of this in baking a large loaf; but he so arranges matters by a clever contrivance that part of the original leaven is always carried on unaltered, carefully preserved for the next baking. Nature is the baker, the loaf is the body, the leaven is the germ-plasm, and each baking is a generation."

When respective functions and relative importance from a genetic point of view, of germ-plasm and body-plasm are understood, it must be fairly evident that the natural point of attack for any attempt at race betterment, which aims to be fundamental rather than wholly superficial, must be the germ-plasm rather than the body-plasm. The failure to hold this point of view has been responsible for the disappointing results of much of the sociological theory of the last century, and for the fact that some of the work now carried on under the name of race betterment is producing results that are of little or no significance to true race betterment.

## CHAPTER III

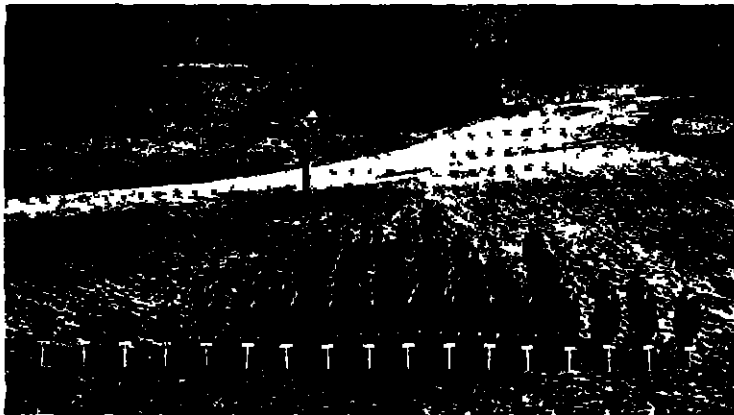
### DIFFERENCES AMONG MEN

When Thomas Jefferson wrote into the Declaration of Independence his belief in the self-evidence of the truth that all men are created equal, he may have been thinking of political rights mainly, yet he was expressing an opinion common among philosophers of his time. J. J. Rousseau it was who had made the idea popular, and it met with widespread acceptance for many years. It is not surprising, therefore, that the phrase has long been a favorite with the demagogue and the utopian. Even now the doctrine is by no means dead. The American educational system is based largely on this dogma, and much of the political system seems to be grounded on it. It may be seen in the tenets of labor unions, in the practice of many philanthropies; in fact, traces may be found almost anywhere one turns.

Common enough as applied to mental qualities, the theory of human equality is even more widely held of "moral" qualities. Men are considered to be equally responsible for their conduct, and failure to conform to the accepted code in this respect brings punishment. It is sometimes conceded that men have had differing opportunities to learn the principles of morality. But it is widely held that their failure to follow the principles indicates not inability but unwillingness. In short, public opinion rarely admits that men may differ in their inherent capacity to act morally.

Yet the most casual glance over any crowd will make it plain that people differ from each other in every way. If the most extreme cases are excluded, it has been found for a wide variety of physical and mental characteristics that the best in a group are a little more than twice as good, or as big, or as powerful, or as fast, or whatever it may be, than the worst.

If such a conspicuous characteristic as stature is selected for study, the observant eye will note that people of average height are commoner than those at the two extremes. If all the men in a group are arranged in columns, according to height, this fact is brought out more strikingly (Fig. 6). Such columns



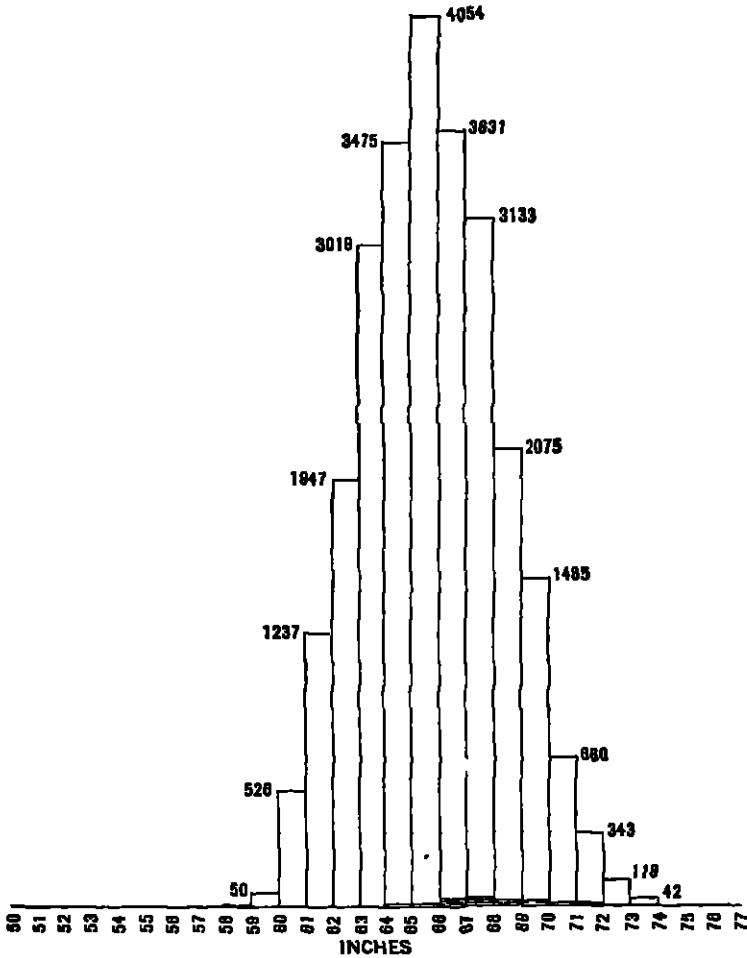
CADETS ARRANGED TO SHOW NORMAL CURVE OF VARIABILITY

FIG. 6—The above company of students at Connecticut Agricultural College was grouped according to height and photographed by Albert F. Blakeslee. It constitutes what is technically known as a "population grouped in arrays of variates." The middle rank gives the median height of this population, the longest rank gives the mode (5 ft., 8 in.). If a line be drawn connecting the upper ends of the rows, the resulting geometric figure will be a "variability curve," such as is shown in several succeeding figures.

may also be represented graphically (Fig. 7) with a similar result.

If one takes a mental rather than a physical characteristic, the result is no different. Mediocre mentalities, as measured by the I.Q. scale, are in a majority, and on each side of the average the distribution tapers off symmetrically (Fig. 8). There are substantially as many at a given distance—say 25 points—above the average of 100, as there are at the same distance below it.

This type of curve, the so-called normal curve, is the product



VARIAION IN HEIGHTS OF U. S ARMY RECRUITS

FIG. 7 —Height is one of the stock examples of a continuous character—none of which all grades can be found. As will be seen from the above diagram, every height from slightly under five feet to considerably over six feet can be found in the army, but extreme deviations are relatively rare in proportion to the amount of deviation from the average. The vertical columns represent the total number of individuals of each height. After C. B. Davenport

of a large number of factors working according to the laws of chance. Its origin may be seen in the target of a hypothetical expert marksman (Fig. 9), or in the careers of a handful of beans rolled down an inclined plane (Fig. 10). A line drawn over the top of such an array produces a step-pyramid (Fig. 11). As the number of classes is increased, the steps become correspondingly smaller (Fig. 12), until with an infinite number of classes the mathematician derives his ideal smooth curve, in which the separate steps of the pyramid have been ironed out into a flowing line. This normal curve is the fundamental concept in the study of variability, and it applies to nearly all human characteristics that have so far been subjected to measurement.

The differences exist not merely in adult, but equally in infantile, and even in fetal, life. Differences in size, to continue the chosen example, go back presumably to the original fertilized egg-cell, and measurably to the embryo at as early a stage as it can be examined.

True, the original fertilized egg-cell that is to produce a 6-foot man is no larger than that which will produce a 5-footer. And the individual cells produced from the repeated divisions of this original one are no bigger than the average. But there are more of them. The rate of cell division is more rapid in the large baby than in the small baby. Hence, the original fertilized egg-cell evidently had a higher potentiality; it was set to run at higher speed, if one may speak somewhat figuratively. And this greater rapidity of cell division was there from the beginning, because it was inherited.

This does not mean that all the children of a given pair of parents will be of the same size; for every one knows that they will not. But it does mean that children from a predominantly tall ancestry will tend, in general, to be above the average in size; just as those from a predominantly short ancestry will tend, in general, to be below the average in size (Fig. 3). Within a given family there is still variability, and if a couple could produce enough children to allow a fair representation, their own children would be found to form a normal curve, but with

a mean higher or lower than the average, according to whether the ancestors were tall or short.

Those ignorant of the mechanism of heredity sometimes cite, as "evidence" that "heredity does not amount to much," the fact that parents may have a child who grows up to be taller, or shorter, than they themselves are. To those who know

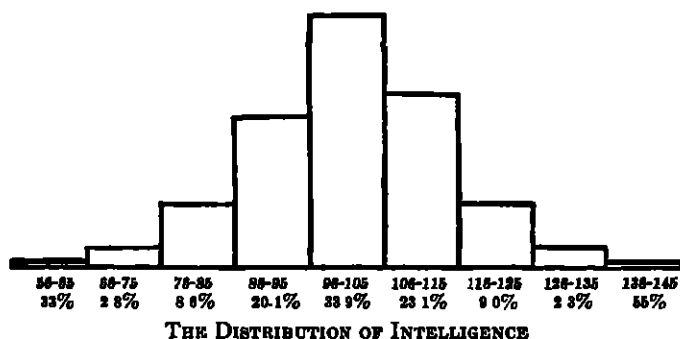


FIG 8.—Diagram showing the mentality of 905 unselected children, 5 to 14 years of age, as measured by the Intelligence Quotient. Persons who are average, normal, or as a statistician would say, mediocre, are most numerous. On the negative side (left hand) the amount of abstract intellect becomes smaller as do the numbers of its possessors, on the positive side (right hand) the amount of abstract intellect increases but its possessors also become rarer. Other groups of children, or adults, would show slightly different distributions, but the general shape of the curve would be about the same. Aft., Lewis M. Terman.

something of the mechanism of heredity, any other result would be incredible.

Prior to the union of spermatozoön and ovum, each of these discards half of its chromosomes. Previously each cell contained the full 24 pairs. If this number were not reduced prior to the union, the resulting fertilized egg-cell would have not 24 pairs, but 48, and therefore, lose the number characteristic of the species. It is necessary to keep this number, if the egg-cell is to develop normally. Hence, by a preliminary series of operations, each of the germ-cells has got rid of one member of each pair prior to the union.

By the same operation, it has necessarily lost one-half of its genes, which are then supplemented by those of the other germ-cell. Such a *shuffling* process holds an almost infinite number of possibilities of recombinations, and it is evident that the offspring can not duplicate either parent. According to chance, the offspring may get a better or a worse selection than either parent had. A simple analogy may be taken from card games. One may lay out two good hands for bridge or poker, and by picking out half of the cards from each one and putting them together, may obtain a hand much inferior to either of the "parents." Conversely one may lay out two worthless hands and by picking out from each one the proper cards, may produce one excellent hand. The same result might be obtained, in principle, if the cards were picked out in each case blindfolded

Similarly, through the reduction division and the subsequent union of two germ-cells, each with half the normal complement of chromosomes and their genes, the offspring may get a combination either more favorable or less favorable than that of either parent

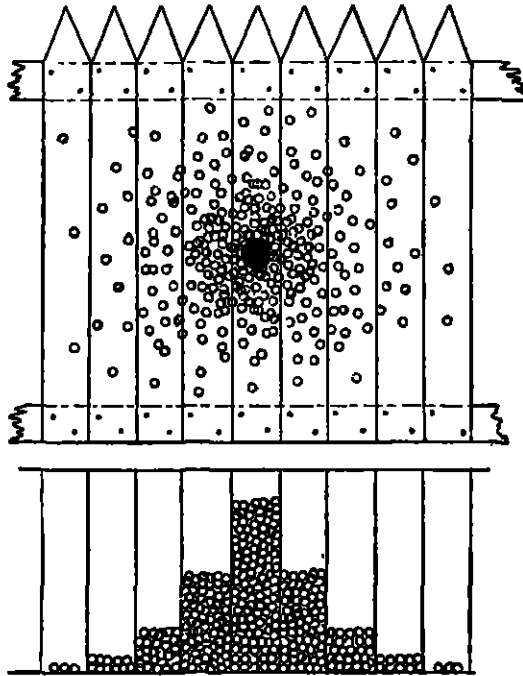
And no two offspring can be alike (barring the special case of identical twins, which are not two offspring, genetically speaking, but merely two halves of one child) because no two will get quite the same combination from the reduction divisions in the paternal and maternal germ-cells

Since the child gets half of his genes from each parent, the general tendency will be for children to correlate with parents, in respect to any particular characteristic, to the extent of .50. This is subject to change by dominance and by environmental influence. On the other hand, since there is an equal chance that two brothers do or do not get the same chromosome from a parent, they too tend to correlate to the extent of .50, subject to the limitations named above. The theoretical resemblance due to heredity, either between parent and offspring or between two sibs, is therefore .50.

It is needless to say that the inherited characters exist only



by virtue of certain necessary conditions which permit them to develop. They can not, therefore, be considered apart from their surroundings. It is not a question of "heredity vs. en-



ORIGIN OF A NORMAL PROBABILITY CURVE

FIG 9.—When deviations in all directions are equally probable, as in the case of shots fired at a target by an expert marksman, the "frequencies" will arrange themselves in the manner shown by the bullets in the compartments above. A line drawn along the tops of these columns of bullets would form a "normal probability curve." Diagram by C H Popenoe.

vironment" but of "heredity working in the environment." There is no room for antithesis.

On the other hand, given a certain genetic constitution one may profitably investigate how far changes in the environment can cause changes in the development of the individual with such a constitution. Or given a certain standard environment,

such as most Americans encounter, one may ask how far differences in inborn constitution are made manifest. These lines of investigation were suggested in the first chapter.

Certain lines of development seem to be more subject to outside pressure than do others. In general, there seems to be some relation between the length of time needed to complete the development of a character, and the possibility of modifying greatly the course of that development.

Thus the color of the eyes seems to be the result of a relatively short, simple, and straightforward line of development. It is a matter of common observation that they can not be changed readily by any influences brought to bear on them.

The teeth, again, are laid down in the jaw before the child is born. No amount of spinach or certified milk will change their position, their order of eruption, or their form, though an extraordinary poisoning of the whole body, such as is due to congenital syphilis, may bring about some incompleteness of development.

The nervous system, likewise, is laid down early in embryonic life and is complete as to fundamentals long before the child is born. Few, if any, cells are added to it after birth. The brain grows by increase of the size of individual cells, by formation of paths between them, and by the insulation of the nerves in sheaths of myelin to make them work effectively. But unless a child is born with a normal number and normal quality of cells, nothing can be done later to improve his endowment.

The reproductive organs, on the other hand, are differentiated rather late in embryonic development; they are far from complete at birth; they undergo marked growth and differentiation at puberty 12 to 15 years later. Finally, in the case of the female they undergo a still further and notable growth and differentiation after marriage and the first pregnancy. By contrast with the nervous system, which virtually completes its development in six or seven months after conception, the reproductive system may not complete its development for 20 or 30 years from the same date.



#### NORMAL VARIABILITY CURVE FOLLOWING LAW OF CHANCE

FIG. 10.—The above photograph (from A. F. Blakeslee) shows beans rolling down an inclined plane and accumulating in compartments at the base which are closed in front by glass. The exposure was long enough to cause the moving beans to appear as caterpillar-like objects hopping along the board. Assuming that the irregularity of shape of the beans is such that each may make jumps toward the right or toward the left, in rolling down the board, the laws of chance lead to the expectation that in very few cases will these jumps be all in the same direction, as is demonstrated by the few beans collected in the compartments at the extreme right and left. Rather the beans will tend to jump in both right and left directions, the most probable condition being that in which the numbers in the two directions are equal, as is shown by the large number of beans accumulated in the central compartment. In like fashion a series of factors—either of heredity or of environment—if acting equally in both favorable and unfavorable directions, will cause a group of men to form a similar variability curve, when classified according to their relative height, relative intelligence, or other character, as is shown in several of the preceding illustrations. If the board above were tilted to one side, the curve of beans would be altered by this one-sided influence and would no longer form the familiar bell-shaped pattern of the normal curve. Similarly skewed curves in the distribution of human characters are due to excess of factors operating in one direction; but they are rare compared with normal curves.

With so much more time during which external influences can make themselves felt, it seems reasonable to suppose that the development of the reproductive system might be more subject to arrest or disturbance than that of, say, the nervous system. And the evidence seems to bear out this supposition.

Finally, those characteristics would naturally be most subject to change, which, though based on the individual's inherited equipment, are mainly the product of tradition or education, or of the conditioning of reflexes. In this sense a man's moral behavior is much more open to influence by education, by example, or by inspiration, than are his intellectual processes, which are more closely limited by his inherited intellectual equipment. Even here his inborn endowment limits him in various ways by prescribing the type of his reactions, whether slow or quick, by his emotional stability, and by the degree of his intelligence to foresee the results of actions.<sup>121</sup>

Since differences need the proper environment stimulus to appear, the differences among people will be greatest where the environment is, in general, the most favorable for each one. Conversely, there may be environments so bad that many human differences do not appear in them. It has been argued that the Polish and Russian Jews form such a group. Confined for centuries to ghetto life, with most lines of activity closed to them, they were relatively undifferentiated. Now that the barriers have been let down, and they have taken their place in the greater society, talents which have for generations been lying dormant or unused are coming to light, and abilities of many kinds are found in strata, which, with a people subjected to longer and fuller differentiation, rarely furnish such ability. If this is a true picture, it will now be only a question of a few generations, presumably, before the Jews are sifted out like other European peoples.

Evidently it is necessary from a eugenic point of view that the differences among men not only be given a fair opportunity to make themselves manifest, but that they be observed, recorded, and published.

While people are more than willing to advertise traits that they consider particularly meritorious, there is a strong and widespread emotional objection to letting oneself be known for what one really is. School boards have had to wrap the findings of mental tests in such secrecy that not even the pupil's



THE "CHANCE" OR "PROBABILITY" FORM OF DISTRIBUTION

FIG. 11.—The step-pyramid, formed by drawing lines along the tops of a series of columns, is the foundation of the normal probability curve. Increase in the number of steps tends to smooth out the curve, as is shown in the following illustration.

parents are allowed to know what his I.Q. is. Ancestry is systematically misrepresented, giving rise to innumerable jokes, such as that concerning the uncle who was electrocuted at Sing Sing and said to be described in the family genealogy as having "occupied the chair of applied electricity at one of the state's greatest educational institutions." Some physical diseases seem



PROBABILITY CURVE WITH INCREASED NUMBER OF STEPS

FIG. 12.—As the number of steps in a step pyramid is increased, by a larger number of categories, the pyramid is ironed out into a smoother curve. With the infinitely large distribution which the mathematician postulates, the curve becomes a perfectly smooth line.

to be considered more disgraceful than others; tuberculosis in the United States, leprosy in Japan, being particularly subject to concealment; while the imputation of a mental disease is considered so disreputable as to be ground for breaking off a friendship.

Progress toward greater honesty will inevitably be slow, but it should be a part of future ethics to lay the cards on the table, in regard to inheritance and personal qualities. In no other way can wise mating and successful parenthood be assured. As a start, the public should be educated to the idea of publicity for school marks, intelligence quotients, physical ratings, and the like. A better balanced idea of personality, in which due weight is given to other types of intelligence and to other mental attributes, would take away much of the fear of the I.Q. that exists in circles where it is supposed to be the main measure of a man.

Since detailed measures of ability and fitness have for the most part not yet been devised, the public now has to fall back on indirect measures such as social standing, economic competency, and the amount of formal education received. These all have a positive correlation with real eugenic value, but the correlation is far from perfect, and there are so many individual exceptions that specific information would be much more useful.

On this point there has been so much misrepresentation that a brief discussion is necessary. It is true that the eugenist finds it impossible to gather statistics directly, about persons of highest eugenic worth. He can not be sure that a group containing the best one-tenth of any population, in respect to eugenic worth, is the same as the best one-tenth by the measurement of any one well-esteemed trait. But is it fair to say, therefore, that there is no positive correlation whatever between such traits as economic status, educational or intellectual test scores, and eugenic worth? Such an assertion is untenable. Or, since it is admitted that there is not a perfect correlation, shall it be said that the measurement of any one trait of those listed is of no practical avail? Oddly enough, this last position is taken by some of those who berate the eugenist for "confusing" eugenic worth with some of these partly correlated traits.

Such a critic must be reminded that nearly all selection in human society is based on correlations that fall far short of perfect. The bride-to-be wants, as a suitor, a man who will be

a good husband. She has no way of measuring directly his merit as a husband so she judges him by traits that are correlated with that, such as his excellence as a companion and as a suitor, the character of his family, and his success in his profession. The farmer wishes the best variety of wheat for his farm. He has no way, aside from trial, of determining this except by picking out the variety that has proved best on the farm of the state agricultural experiment station. A college wants a good president. Its trustees elect to the position a man who has been a good department head, believing that there is some correlation between the qualities that enable a man to run a department successfully, and the qualities that enable him to run a university successfully.

Similarly with regard to the program of negative eugenics, society often restricts the reproduction of a whole group, because a large proportion of its members would have defective offspring, even though it is known that some of its members might leave offspring who would be relatively normal. This is a valid basis of procedure until a better one can be devised. No one criticizes the inspector who condemns trichinous pork, though he knows that this infested pork will not all be eaten raw, and that only the part which is eaten raw will be dangerous. No one complains that he is "confusing" trichinous pork with pork that is unfit for human consumption. The authors never knew a eugenist who actually "confuses" eugenic worth with economic worth, that is, one who considers that these qualities are identical. But eugenists do believe that there is some correlation between eugenic worth and economic success (see Chapter VI), just as they believe that there is some correlation between eugenic worth and good intelligence, or good health, or good morality. The program of eugenics is based to a large degree on the existence of these correlations.

Eugenically, perhaps the most important generalization in regard to individual differences is that good qualities tend to go together, and bad ones likewise. This is inevitable from the fact that different types of ability depend in varying degrees

on certain common components. The tendency is accentuated by assortative mating, which continually brings together into the same stream of heredity, similar degrees of various qualities. Thus a person who makes a success in one line might not have done so well in another, but he would probably have done better than the average in a number of others.

Furthermore, intellectual superiority is associated to some extent with physical superiority. Thus, to cite a striking illustration, college honor men, who are picked out merely because of intellectual superiority, are also longer-lived than the average student.<sup>154</sup> There must necessarily be selection in the various groups. The honor men presumably had to have fairly good health and physical fitness, otherwise, they could not have attained honors in their studies. But they were picked out primarily for intellectual qualities. Good mental traits and good physical traits go together, just as good mental traits of different kinds are associated.

In the same way school children who are much brighter than the average are found to be heavier and taller than the average, and they surpass the average in such tests as strength of grip. They are inferior to the average only in ability to chin themselves, where they are handicapped by their heavier proportional body weight.<sup>101</sup>

At the other end of the scale, degree of physical deficiency is closely associated with degree of mental deficiency.<sup>20</sup> Retarded school children are under the average in weight and height, compared with the general school population, and the more definitely feebleminded suffer from physical handicaps of all kinds.

The objection is sometimes heard that a eugenic program will produce certain types of superiority, but that these may not be the types needed in the society of the future. In the light of the correlation of traits, such an objection is seen to be based on fantasy. If people are better in any one respect, they will likewise be better in many other respects. On the other hand, if the race is allowed to deteriorate in one way, say in intelligence or physical fitness, it will deteriorate in others.



## CHAPTER IV

### THE INHERITANCE OF HUMAN DIFFERENCES

In northeastern Moravia, near the point where the boundaries of Czecho-Slovakia, Germany, and Poland join, is a peaceful agricultural region known as the Kuhländchen whose population, partly Slav and partly German in origin, devotes itself to dairying and some fruit growing. Here, since at least the sixteenth century, has been found a family of prosperous peasants named Mendel. They were apparently of South German origin—from Wurtemberg, according to some. Since 1683 the family has been settled in Heinzendorf, a neat village boasting some 70 houses.

Anton Mendel, born in 1789, took part in the later Napoleonic wars, in the course of which he saw much of the world. Returning to settle on the ancestral acres, he married in 1818 Rosina Schwirtlich, daughter of a neighboring gardener. She gave birth on July 22, 1822, to their second child, a son baptized Johann, who was later to make the family name immortal.<sup>80</sup>

Coming of a family which devoted itself to gardening—while most of its neighbors were inclined rather to dairying—Johann naturally absorbed in childhood a love of plants, which remained one of his most marked characteristics throughout his life. And he had many of the typical peasant qualities—industry, thrift, patience, and thoroughness. He attended the neighborhood schools, and then, because his mother wanted him to be a teacher, he went to a near-by Gymnasium and college. By the time he was ready to enter the university, the family resources were exhausted. As the only way to continue his education, he joined the Augustine order, which had a monastery in Brunn (Brno on modern maps), being admitted in



GREGOR MENDEL

FIG. 13.—Johann (afterward given the ecclesiastical name of Gregor) Mendel (1822-1884) is universally recognized as the father of the modern analytical study of heredity, because of his fundamental discoveries which, however, were not put to use by other scientists until a generation after his death.

1843 as a novice and given the name of Gregor, which he thereafter used before his baptismal name.

Mendel taught natural sciences in the neighboring secondary school, while he dwelt at the monastery in two rooms which he had turned into a laboratory for nature study. Visitors reported finding them full of cages of birds, white and gray mice, and any animals that came his way—among them a tame fox and even a porcupine. In the garden he had his bees, his flowers, and his fruit trees. He grew pineapples in a hothouse, near which he had installed a delicate aeolian harp that responded to every vagrant breeze.

His garden plot, 35 meters long by 7 wide, is well known from subsequent photographs. Here he grew plants of all kinds, and he had begun perhaps as early as 1854 the experiments with garden peas on which his fame rests. He worked, however, with at least 30 other genera. In 1865 he read a paper to the local natural history society, on hybridization experiments with peas. These furnished the clue to the analytical study of heredity, which had escaped many men of apparently greater ability, working with far greater resources.

This, the happiest period of his life, was interrupted in 1868 by his election to the position of abbot of the order. Thenceforward he devoted himself energetically and successfully to the management of the many properties which the Augustinians possessed in Moravia, traveled widely, took an active part in local affairs, and even became, despite his personal indifference to them, a liberal patron of literature, music, and the fine arts. Later years were clouded by a dispute with the government over taxation of the order's properties. He died on January 6, 1884.

Mendel's publication on heredity in 1865 did not happen to meet the eye of anyone prepared to recognize its importance until 1900, when three other investigators independently reached similar conclusions. One naturally asks, what did Mendel do that others had not done, which enabled him to succeed where all others had failed?

1. He focused his attention not on a whole plant, but on a single characteristic. He selected a simple, clear-cut character, and watched it through several generations. This had been done by some of the investigators, but not by all.

2. He crossed two individual plants which differed sharply in regard to this character. If he had a pea vine of normal height, he crossed it with a dwarf. If he was studying the skin of the seed, he crossed a smooth skin with a wrinkled skin, or a yellow one with a green one. This, again, had been done by others, though not by all.

3. He went to great pains to count up the exact numbers of each kind of character that resulted from his crosses. No one else had done this systematically enough to hit on the fact which he discovered, and which was the key that unlocked the riddle of heredity—namely, that the various characters occurred in regular ratios and that one, after a little previous observation, could even predict what the ratio on the average would be.

4. He followed these characters through several generations, instead of stopping with the first generation of hybrid offspring. Others had done this, but not many, and even today many experiments are of little worth because they are not carried through enough generations to bring out the full facts.

The relationships found by Mendel, working with single gene differences in peas, led to an enormous amount of work since 1900, in which millions of plants and animals of many different kinds have been bred under carefully controlled conditions. The segregation he discovered holds good, in general, of all single gene differences. Studies of hundreds of human family histories dealing with thousands of men, women, and children have shown that similar ratios are also found in mankind for single gene differences.

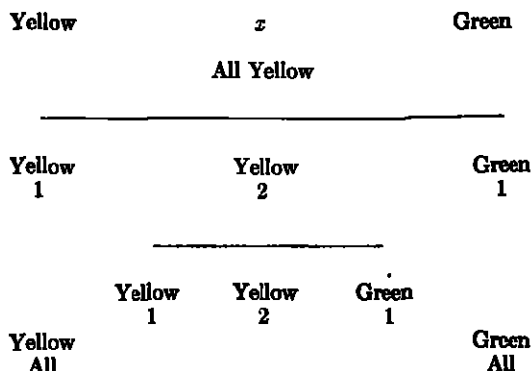
One of Mendel's examples will serve as well as any other to demonstrate the principle which he discovered. Take two kinds of peas, one of which when ripe has a yellow seed-coat, the other a green. If these are crossed, the offspring will all produce

seeds with yellow coats. The green has disappeared altogether.

But if these hybrid offspring (the first filial generation, conventionally denominated the  $F_1$ ) are bred with each other (or, to make the case applicable to human traits, if they are mated with others of the same kind) the offspring are found to be three-fourths yellow, one-fourth green (the characteristic 3 to 1 ratio of a simple Mendelian difference).

Carrying the breeding on through succeeding generations discloses that this 3 to 1 ratio is in reality a 1 to 2 to 1 distribution—i e., of the three yellows, one will continue to breed yellow indefinitely if bred to its own kind, while the other two will continue indefinitely to produce offspring that show the 1 to 2 to 1 distribution.

In short, the gene which produces, among other things, a green seed-coat, and that which produces a yellow one, are separate; they sort out independently as would be expected if they are paired in opposite chromosomes; and neither is "contaminated" by sojourn alongside the other through a plant-generation or more. The green does not become yellowish or the yellow greenish by this association. This is the concept of the "purity" of the genes, which is one of the fundamental principles of the modern knowledge of heredity, as the random assortment or segregation of the genes is the other. The behavior is shown schematically in the following diagram:





ROBERT ROY, A TYPICAL ALBINO

FIG. 14.—This man, about 55 years old at the time of the photograph, was one of 10 children, all the rest being pigmented and one having black hair. Their father had very dark hair, the mother sandy hair. Evidently both parents carried the recessive gene for albinism. Photograph from Eugenics Record Office (Carnegie Institution of Washington).

FIG 15—Annie L. W., who was exhibited in various shows, met Robert Roy (Fig. 14) in the same business, and they married about 1890 (C. B. Davenport, *Journal of Heredity*, May, 1916). She was one of 12 children, of whom three others were albinos, eight pigmented. From the marriage of two albinos, only albino children would be expected. The son of this mating is shown in Fig. 16. Photograph from the Eugenics Record Office (Carnegie Institution of Washington).



MRS. ROBERT ROY

Now if the gene which produces a yellow seed-coat be designated by a capital  $Y$  and its opposite, which in this case produces a green seed-coat, be designated by a small  $y$ , following the conventional custom, then the original parents will be represented by the formulas  $YY$  and  $yy$  respectively, since each in turn received the same character from both its parents. The original cross will therefore be  $YY \times yy$ , and this can be multiplied algebraically, producing  $Yy + Yy + Yy + Yy = 4Yy$ —

FIG. 16.—Only child of Mr. and Mrs. Robert Roy (see the two preceding illustrations). The lower part of his face resembles that of his mother, the upper part that of his father. Albinism exists in all grades, but in this father and son it is very nearly complete. Photograph from the Eugenics Record Office (Carnegie Institution of Washington).



KING CHARLES ROY

in short, all the possible offspring have the same formula. They have received yellowness from one parent and greenness from the other, to state the matter popularly; and the greenness is concealed, overlaid, or dominated by the yellowness. Yellow is therefore said, in this cross, to be dominant to green.

The results of any such cross are most easily seen by writing them in the conventional checkerboard, as follows.

## HARD EUGENICS

	$y$	$y$
$Y$	$Yy$	$Yy$
$Y$	$Yy$	$Yy$

Adding up the four boxes, one gets  $4Yy$ . All of the offspring will be alike; and which color they will be can only be told by making the cross, or by inquiring from some one who has made it. Observation shows that they will all be yellow.

For the first generation of offspring the dominant therefore has an advantage. But in the second and all subsequent generations, the population is in stable equilibrium, to use the technical term. The proportion of the various classes is  $1:2:1$ . The dominant does not gain on the recessive as generations go on; after any length of time one wishes to assume, they will be in the same proportions.

Dominance is not a completely plus or minus characteristic. It may be absent, and when present it may be partial or variable. In dealing with human traits, one finds that a given abnormality, as, for instance, hereditary ataxia, is dominant to the normal in one family, but recessive to the normal in another. The important fact is not that one gene dominates another (for it may not do so at all), but that the two genes separate out of a cross, without change.

Now if the  $1:2:1$  distribution be graphically represented by columns, it will look like this:





and if a line be drawn along the tops of the columns, thus:

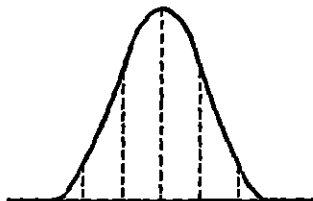


it will resemble in some degree the "normal curve" of distribution of traits, which was described in the preceding chapter.\* The more independent genes one deals with, the more points one will have to mark in position on the curve. Thus from a mating in which two separate factors are involved, the proportions among the offspring will be 9 to 3 to 3 to 1, the total being not 4, but 16, the square of 4; while 3 separate factors would yield the cube of 4, or 64 separate combinations.

To follow the development of the normal curve one step farther, take the case of skin color in Negro and white matings, which C. B. Davenport has studied.<sup>20</sup> Assuming, as he does, that there are two separate factors for pigment involved, the second generation would yield the following combinations:

4 genes for black skin	1 individual
3 " " " "	4 "
2 " " " "	6 "
1 " " " "	4 "
0 " " " "	1 "

Now if the types of individuals in the second column are represented by lines of appropriate heights, and a curve drawn over the tops of the columns, the result will look like this:



\* Mathematically, the normal curve is an expansion of the binomial  $(a + b)^n$ .

This shows how the population is distributed in a normal curve, in respect of skin color. It is believed that the normal curve found for height, or general intelligence, or any other trait, simply means that the trait is due to the action of many genes operating together.

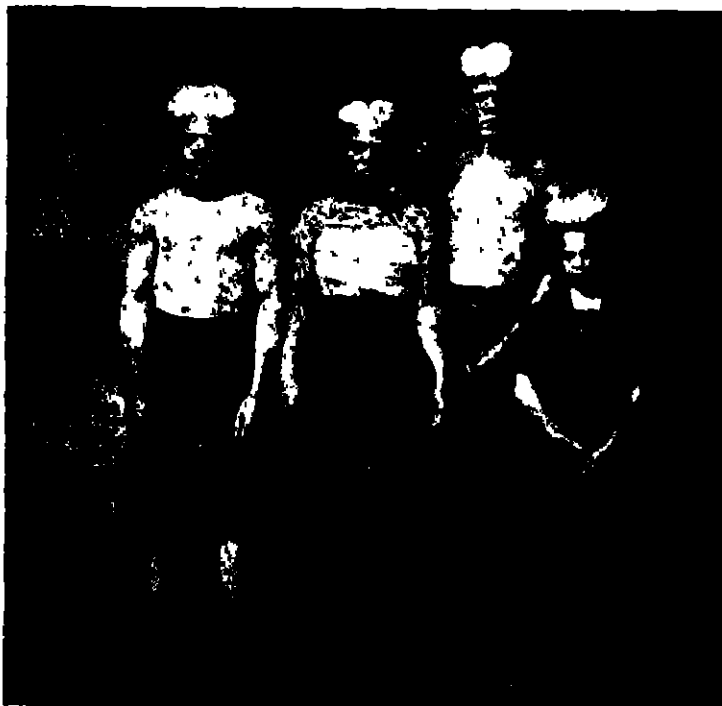
In such cases, it is obvious that the situation becomes too complicated for checkerboard analysis, and a different technique of investigation must be used. This is available through the investigations of the founder of eugenics, Francis Galton.

Born in the same year as Mendel, Galton, who was a half-first-cousin of Charles Darwin, studied mathematics and medicine, traveled widely, attained fame as an explorer in South Africa, and, after inheriting an income which made him independent, settled down to the pleasant and useless life of an English country gentleman. An intellect such as his could not endure this existence long, however, so in a few years he established himself in London and gave his time to pioneering in many fields of knowledge. He contributed largely to founding meteorology as a science, opened up the subject of experimental psychology, made significant contributions to anthropology, and introduced the system of finger prints to practical use. Finally, he took up those researches in heredity and eugenics to which he gave most of his efforts for half a century till his death in 1911.

Galton was perhaps the one man who, if Mendel's work had come to his attention, would have recognized at a glance the priceless tool Mendel had found, would have seized it and set to work with his combination of enthusiasm, insight, resourcefulness, and judgment rarely equaled. It was only a few months before the appearance of Mendel's paper on pea-hybrids that Galton had published his own first contribution in this field, *Hereditary Talent and Genius*.

Recognizing, like Mendel, the need for dealing numerically with the offspring of a mating, of getting results that could be measured or counted and thereby compared definitely with other similar results, Galton never suspected the existence of

the regular proportions in the offspring of a single pair, which Mendel had discovered. Instead, he began to devise ways of

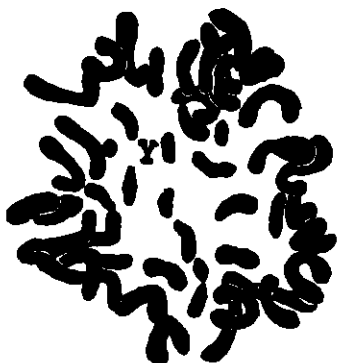


A FAMILY OF SPOTTED NEGROES

FIG. 17.—The piebald factor sometimes shows itself as nothing more than a white blaze in the hair, but it may take a much more extreme form, as illustrated by the above photograph from Q. I. Simpson and W. E. Castle. Mrs. S. A., a spotted mutant, founded a family which at the time of the investigation comprised 17 spotted and 16 normal offspring, in several generations. The white spotting gene behaves as a simple Mendelian dominant, and the expectation would be equal numbers of normal and affected children. Similar spotting factors are known in many animals.

creating statistically the characteristics of large groups of people. His well-directed efforts along this line, arousing the interest of a young lawyer with much greater mathematical equip-

ment than Galton,—namely, Karl Pearson (1857—)—led the latter to develop and apply to biological material the method of correlation which has played such a large part in all subsequent study of heredity, particularly in man.



THE HUMAN CHROMOSOMES

FIG. 18.—The nucleus of every cell in a man's body contains 24 pairs of chromosomes,—little rods such as shown above, each of which may be considered a string of many hundreds of different genes. The X-chromosome may be distinguished at the upper left-hand corner of the letter "Y" which has been inserted; the Y-chromosome is the small round body to the left and just below the X-chromosome. If the cell had been taken from the body of a woman, a second X would have replaced the Y here shown. After T. S. Painter.

The Belgian statistician, L. A. J. Quetelet, a century ago applied the bell-shaped curve of normal probability to such human traits as height, with interesting results. He had noted, for instance, in plotting the heights of recruits to the army, that the curve was discrepant at its lower end, that it did not have the regularity, when applied to the observed figures, that it had in theory. Evidently something had intervened to prevent the data from fitting the curve. In fact, Quetelet was able to show that some of the draft boards were issuing fraudulent returns by certifying, as under military height, some men who were just over it. That accounted for the shortage of men which the

theory required at the end of the curve, and led to a cleaning up of the draft boards.

The normal curve was, therefore, a well-tried concept, and Galton took hold of it with keen interest. It fitted the heights of a group of men; it would also fit the heights of their sons. The practical question was how to compare the two. It was easy to say that a given son was an inch shorter or taller than a given father; it was easy to say that the average of all the

sons differed by such and such an amount from the average of all the fathers; but it was necessary to have a more definite way of comparing the two groups, which would take account of the ranges of the peculiarities of the two groups—to compare two normal curves, in short.

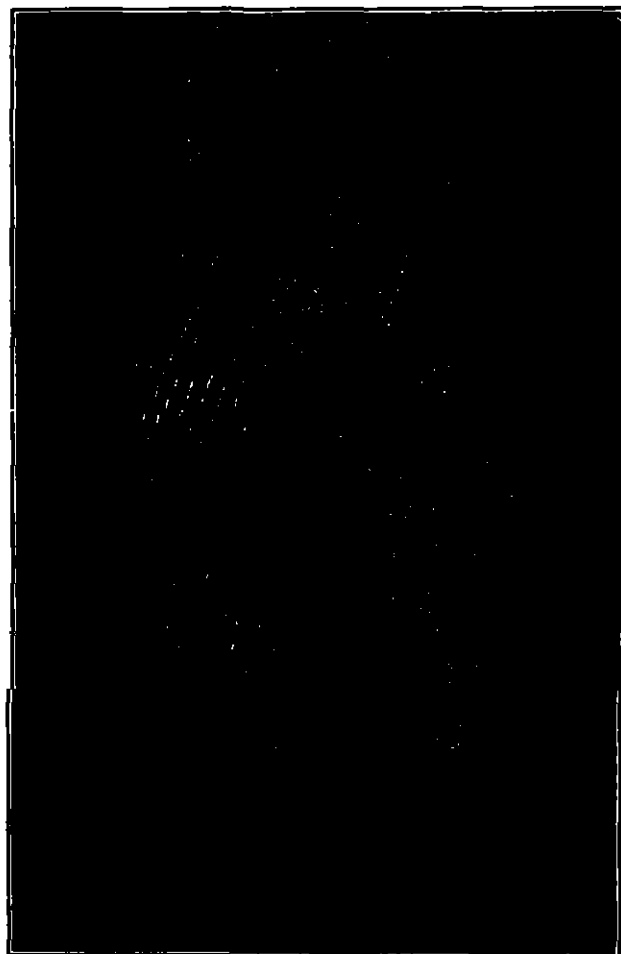
Galton did this by plotting a line which would show how much one changed for a given amount of change in the other. If a group of fathers was, for instance, two inches taller than the average of the whole English race, he was able to show that their sons would exceed the average by only about one-half as much. If the fathers were shorter than average, the sons would be taller than the fathers. In either case, when the fathers' group varied from the mean of the race, the first generation tended to be nearer the mean.

The influence of the remote ancestry, as Galton conceived it, was so great that it tended to pull offspring back toward the mean of the race, when their fathers deviated from the mean. In his phrase, the offspring always regressed toward the mean, from either side—whether they were above it, or below it.

The regression being one-half the deviation of the fathers might be thus expressed:  $r = .50$ . When Galton's simple concept of regression was later developed by Pearson into the concept of correlation, Galton's notation,  $r$ , was retained, and a new symbol used for regression. So  $r$  still stands for the coefficient of correlation, although one would think that  $c$  would be the natural symbol.

The problem was fairly simple if one were dealing with the same character, say height, in both groups, because it was measured in the same unit in each. But suppose one wanted to compare two different things. Instead of finding how height in fathers varied with height in sons, suppose one wanted to find how weight in men varied with their own height. If a man is 3 inches taller than the mean, how reliably can one predict what his weight will be? This simple problem, involving the comparison of inches and pounds, was like adding two apples

FIG. 19.—The palms of the hands and soles of the feet are covered with little ridges or corrugations, which are supposed to be useful in preventing the grasp from slipping, whence the name "friction skin" has been given to these surfaces. The ridges are developed into various patterns; the one above is a loop on the left forefinger. The ridges are studded with the openings of the sweat-glands, the elevated position of which is supposed to prevent them being clogged up; further, the moisture which they secrete perhaps adds to the friction of the skin. The patterns of the friction skin are inherited in some degree. Photograph by John Howard Payne.



A HUMAN FINGER TIP

and three bananas—which every child in the elementary grades is taught can not be done.

The solution was to treat each normal curve in terms of deviations from its own mean, not in terms of the absolute units. Thus the question became: if a man deviates from the mean in height by 10%, by what per cent will he deviate from the mean in weight, each deviation being calculated in its own terms? It happened that the coefficient was found to be .48. Suppose that 160 lbs. is the mean weight of the race and 68 inches the mean height. Then if a man deviates from the mean height by 10% (i.e., 16 lbs.), he will be most likely to deviate from the mean weight by 4.8% or about  $3\frac{1}{4}$  inches.

For any one man, this is only a statistical probability. He is equally likely to vary by a larger or by a smaller amount. For a larger group, however, where the statistical probabilities come into play, the theoretical expectation of 4.8% will be met very closely. The correlation between height and weight in adults is therefore described by saying  $r = .48$ .

If Galton had possessed Mendel's method as well as his own, genetics would probably have been put forward a whole generation, for Mendel's pedigree analysis alone made possible the exact investigation of simple hereditary traits. It applies only with increasing difficulty as one passes to compound traits. Here the Galton-Pearson method of correlation becomes increasingly useful. As most important traits in man are compound, not simple, Galton's method in actual practice is more widely applicable than Mendel's. But as compound traits are made up of simple traits, although one may not know just what these simple traits are, and as Mendel's method alone is satisfactory in dealing with the latter, it is this method which has made the fundamental analysis of heredity possible, and has brought to light the theory underlying it.

The two methods, therefore, complement each other, and each is indispensable to the student of heredity. The amount of progress that an investigator in the foundations of eugenics can make at the present day depends largely (1) on his pos-

sessing these two tools of research with the many variants that have been developed from them, (2) on his knowing which one to use and when to use it in attacking a given problem.

To study the inheritance of abstract intellect, one must depend upon various measurements of this complex character. The current mental tests give a reasonably reliable measurement of the sort of ability that enables one to deal with abstract problems and to profit by ordinary scholastic education.

For many years the Committee on Exceptionally Able Youths of the Civic Club of Allegheny County, Pennsylvania, has been assembling the outstanding students of those about to graduate from high school for special testing. The students invited are those who are selected as having been highest, whether scholastically or in mental tests or in the teachers' estimates. Those selected are then given mental tests and sometimes scholastic tests of which some norms are known. The number of students tested June, 1932, was 188. Awards were given to 64 of these as being in the highest  $\frac{1}{20}$  of the freshman class of an average American college.

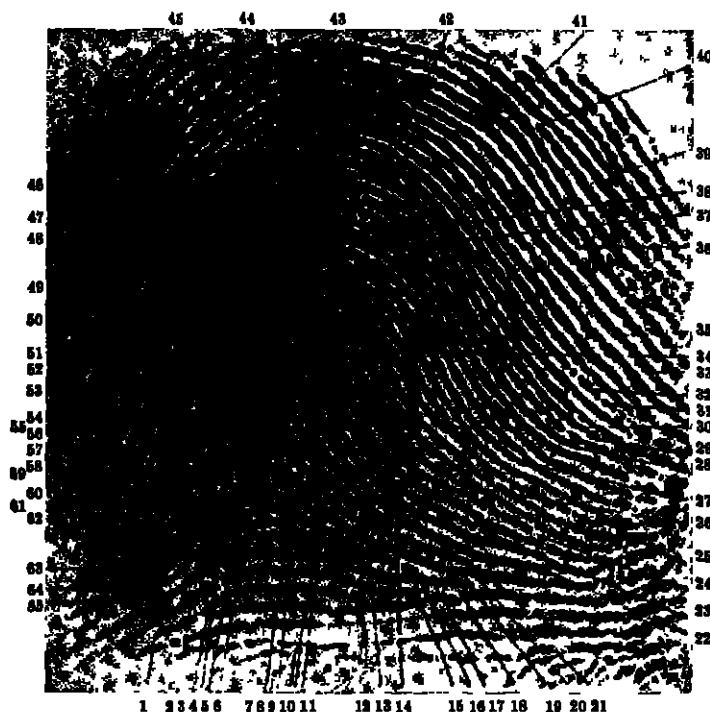
The results of these Civic Club tests have given an opportunity to observe whether the abilities thus discovered are wholly sporadic, are directly proportional to educational advantages, or whether in some degree they "run in families."<sup>128</sup>

In nearly every recent list of awardees there were two or more siblings or cousins of previous awardees. This would be rare indeed if due to chance alone, as the graduates from the high schools of Pittsburgh alone were 2,163 at the 1932 commencement. However, where three or more siblings have graduated it is uncommon for all three to receive an award.

In 1932, for the first time, a third successive sibling in one family won the award. Inquiry revealed that these three were the three eldest siblings in the K family and that there was a fourth sibling just finishing the junior year in high school, who was estimated to be equally capable. A special test consisting of the Detroit Advanced Intelligence Test Form V and the Moss-Hunt-Omwake Intelligence Test (First Revised Edi-



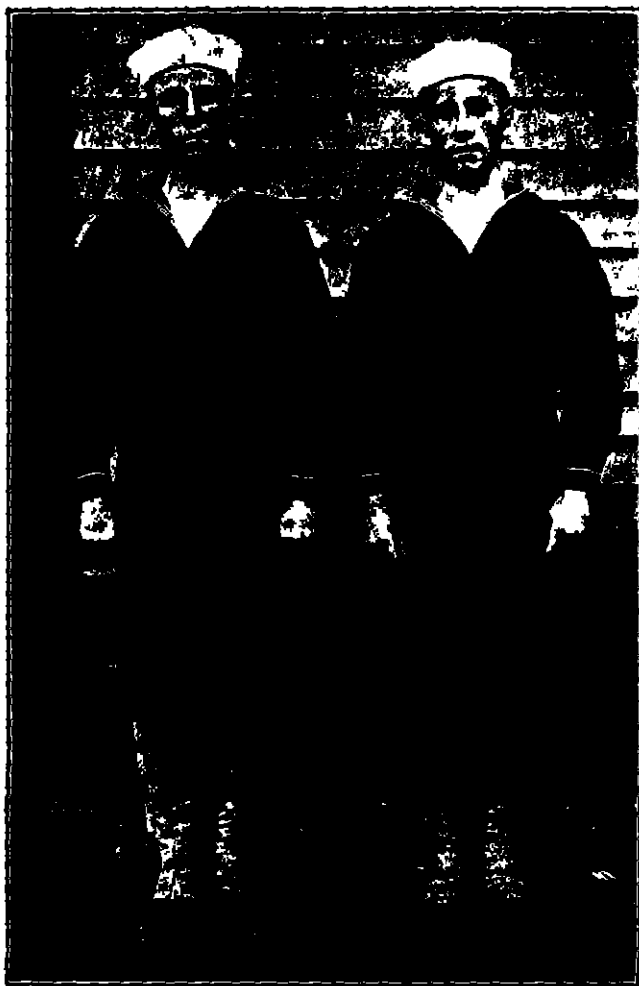
tion) was therefore given simultaneously to the two parents and the four siblings. These two tests were chosen because some



#### THE LIMITS OF HEREDITARY CONTROL

FIG. 20.—Print of a finger tip showing a loop pattern enlarged about 8 times. This is a common type of pattern, and at first glance the reader may think it could be mistaken for one of his own. There are, however, at least 65 "ridge characteristics" on the above print, which an expert would recognize and would use for the purpose of identification, following an ancient oriental practice which was introduced to the western world and systematized by Francis Galton. While the general outline of a pattern is inherited (though not in any simple way), such small characteristics as are shown above seem mainly fortuitous and due probably to the stretching of the skin as it grows. Photograph from J. H. Taylor.

age and education norms were available for them and none of the six persons had taken any form of these two tests. Tests



**A PAIR OF IDENTICAL TWINS**

**FIG. 21.**—Identical twins are developed from a single fertilized egg which possesses two growing points. Hence such twins have substantially identical heredity, while ordinary twins are merely brothers, or sisters, or brother and sister, borne two at a time, and are no more alike than ordinary brothers and sisters born several years apart. The comparison of the two types of twins in different environments has therefore been one of the most fruitful means of studying human heredity. Photograph from J. H. Taylor.

less responsive to information and education would have been preferred, but did not otherwise comply with the requirements.

The result confirmed the previous findings. All four siblings tested with very high scores. The father also had high scores and the mother, though less high, yet showed a superior score. The scores were in general less high in the elements of the "social intelligence" test as the environmental factor is more potent relatively in these tests than in the Detroit test, which is a more typical mental test.

The results of every mental test are in part determined by innate capacity and in part by environmental factors. The relative proportion of the two sets of factors is known to differ to a great degree in the various tests. In this instance the environmental factors operate more against the mother (age forty-eight years, six months) than against the others, as she did not attend college and has lived the life of the home-maker, rearing four children without a servant. The father (age fifty-one years, one month) is a University Lecturer on Health Teaching, also a practicing physician. The sibs, at the time of these tests were: (1) a son, graduated from college one year before, (2) a son who had finished three years in college, (3) a daughter who had just finished her senior year in high school, (4) a daughter who had just finished her junior year in high school.

What was it that made the test scores of these siblings all so unusually high? We infer it was not the college or high school attended, because the boys tested very high in the regular eighth grade public school mental tests, and were recognized then as very high by the Civic Club, receiving its preliminary award. Further, tests have been made of very many students from each of the high schools of the county and the particular high school attended by all four does not produce an unusually large number of awardees. It was not the grammar school because no one grammar school or class within the grammar school furnishes a disproportion of awardees except such as one would expect from the socio-intellectual levels from a certain locality. The second son was able to read before he was

four years old and both skipped the first grade. Furthermore, they attended more than one grammar school.

Was it a particularly stimulating home environment? This is in general apparently a minor factor, for homes where the educational level of parents was higher than in this family have furnished families showing some merely modal youths along with superior siblings.

The main factor, therefore, in these very high scores must be inheritance. One must not conclude, however, that it is common for all four children, even where the inheritance is very good, to have uniformly high scores. On the contrary, that is an unusual feature of this case. Ordinarily more variation is found.

Mental tests in general show a correlation around .50 between parent and offspring, in respect to intelligence scores. Students' marks, in institutions where two or three generations have been educated from the same family, show approximately the same relationship.<sup>5</sup> In general, it may be said that bright children are most likely to come from bright families; and there is no lack of evidence, on the other hand, that dull children are most likely to come from dull families.

Children, then, resemble their relatives in intellectual characteristics as they do in physical characteristics and, on the whole, they tend to resemble them in just about the same degree. The correlation between parent and offspring averages about .50 for physical traits, the inheritance of which is undoubted; it averages about .50 for intellectual traits.

If the resemblance in intellect is to be wholly ascribed to the influence of example, training, or like environment, why not ascribe the resemblance in eye color or body height to the same environment? Such an absurdity need not be refuted. And it turns out that the child resembles a parent with whom he is little associated or has not even seen, nearly as much as the one by whom he is brought up.

Not merely ability in intelligence tests, but other mental characters such as temperament, are found in the same way to

be inherited. It is useful to check the findings in man with those in other animals, since the latter can scarcely be explained by differences of tradition, schooling, or family status.

Taking wildness and tameness as indications of temperament in rats and mice, half a dozen investigators <sup>24</sup> have found similar results—that these differences are inherited, can be increased by selection, and show evidence of segregation, indicating that relatively few genes are producing definite effects. The association of the young with the mother had no effect on their reaction; and the offspring of tame mothers by wild fathers were relatively wild, although they had never seen their father.

If temperament is thus inherited in other mammals, it is likely to be inherited in man. The results of research show that it is, as judged by its early and spontaneous appearance in children, and its distribution in families according to what would be expected on the theory of inheritance.<sup>120</sup>

If intelligence in general is due to multiple genes, the expectation would be that the higher grades of mental deficiency at least are also due to multiple genes. This seems to be borne out by observation, since measuring the actual I.Q.'s of whole families shows the offspring of feeble-minded parents to be sometimes of higher intelligence than either parent, sometimes lower, sometimes intermediate.<sup>124</sup>

Due to assortative mating, which is higher for intelligence than for almost any other known character in man,<sup>128</sup> there is a tendency for the various types of mental, emotional, and physical defects to be associated together. Mentally defective children, therefore, do not appear at random in the United States. Most of them come from the lower intellectual strata of the population. It is not so difficult to find the sources of feeble-mindedness in the nation as has sometimes been supposed.

All this has a bearing not merely on the theory of human genetics, but on the practices of eugenics. If feeble-mindedness were in fact due to a single recessive gene difference, the amount

of it in the population could be reduced perhaps as much as 40% in a single generation, if all the feeble-minded were pre-



FINGER PRINTS OF IDENTICAL TWINS

FIG 22—Above are the finger prints, supplied by J. H. Taylor, of the two young sailors shown in Fig 21. The reader might examine them once or twice without noting any difference, but systematic investigation shows that the thumbs of the left hands and the middle fingers of the right hands are particularly distinguishable. Since identical twins are halves of the same original fertilized egg, they represent, in a sense, the right and left hand components of one individual, and the right hand of such a twin is commonly more like his partner's right hand than it is like his own left hand, in respect to finger print patterns. Finger print patterns therefore form one of the most valuable methods of determining whether a given pair of twins is identical or not.

vented from reproduction by segregation, sterilization, or other means. Thereafter the rate of reduction would become slower

and slower, because so many of these genes, being recessive, would be hiding in apparently normal carriers.

But if mental deficiency is, in general, due to an indefinitely large number of genes without any important relations of dominance, then, given the high degree of assortative mating present in modern society, the elimination of mental deficiency can be brought about by eugenic measures, much more successfully than has sometimes been supposed. A pessimistic view has been expressed by some writers, based on the supposition that feeble-mindedness is due to a single pair of recessive genes, that these genes, when separated, can not be recognized; that they are widely spread throughout the population, and that even the sterilization of all known feeble-minded persons would produce little decrease in the amount of feeble-mindedness in the next generation, because most of this is the result of combinations of recessives in unsuspected carriers. Such a naïve view of heredity is out of date. Accumulating evidence demonstrates that continued selection of the more intelligent part of the population, for reproduction, will raise the average intelligence of the whole population, steadily and surely though of course slowly. If there is any limit to the amount of progress that can be made in this way, it is not now visible or near at hand. All recent development in the knowledge of inheritance has given firmer and firmer support to the practical program of eugenics.

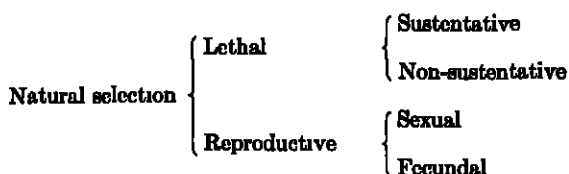
## CHAPTER V

### NATURAL SELECTION

#### 1. LETHAL

Natural selection operates at three points in the individual's life, through (1) a selective deathrate, (2) selective mating, and (3) a selective birthrate. The first of these forms has often been considered the whole of natural selection, but wrongly. The third gains steadily in importance as an organism rises in the scale of evolution.

The different aspects of natural selection may be classified for the present purpose as follows:



The lethal factor is the one which Darwin himself most emphasized. Obviously a race will be steadily improved, if the worst stock in it is cut off before it has a chance to reproduce, and if the best stock survives to perpetuate its kind. "This preservation of favourable individual differences and variations, and the destruction of those which are injurious, I have called natural selection, or the survival of the fittest," Darwin wrote; and he went on to show that the principal checks on increase were overcrowding, the difficulty of obtaining food, destruction by enemies, and the lethal effects of climate. These causes may be conveniently divided as in the above diagram, into sustentative and non-sustentative.

The sustentative factor has acquired particular prominence



in the human species, since Thomas R. Malthus wrote his essay on population—that essay which both Darwin and Wallace confess was the starting point of their discovery of natural selection.

There is a "constant tendency in all animated life to increase beyond the nourishment prepared for it," Malthus declared. "It is incontrovertibly true that there is no bound to the prolific plants and animals, but what is made by their crowding and interfering with each other's means of subsistence." His deduction is well known: that as man would, unless checked, increase in geometrical ratio, and can not hope to increase his food-supply more rapidly than in arithmetical ratio, the human race must eventually face starvation, unless the birth-rate be reduced.

Darwin was much impressed by this argument and ever since his time it has usually been the foundation for any discussion of natural selection. Nevertheless it is partly false as applied to all animals, as one of the authors showed some years ago,<sup>81</sup> since a species which regularly eats up all the food in sight is rare indeed. It is of little racial importance in the present-day evolution of man outside of the overpopulated Orient. Scarcity of food may put sufficient pressure on him to cause emigration, but rarely death. The significance of Malthus' argument to eugenics is greatly altered, since the advent of birth control.

Non-sustentative lethal selection is far-reaching in its effects, and operates at every age. Several periods may be distinguished for convenience.

1. Intra-uterine selection is intense, and probably tends particularly to eliminate individuals with defective constitutions, since a much larger number of children is conceived than is actually born alive. Certain types of genetic combination are not viable, and lead either to a still-birth, to an early miscarriage, or perhaps more frequently to the death of the embryo at such an early stage that the mother no more than suspects that she was pregnant. Moreover, the death-rate in this period

has shown little change during recent years,<sup>143</sup> indicating that selection is still intense here, whereas the lowered rate of infant mortality (i.e., during the first year after birth) suggests a lowered intensity of natural selection which will be discussed further in section (2). Many of the intra-uterine deaths (one-fourth in a series<sup>68</sup> of 1,673 cases) are due to diseases of the father or mother, albuminuria and syphilis standing in first and second place respectively. The deaths from the former cause, at least, tend to eliminate strains that have a kidney defect.

The most striking phase of intra-uterine death, and one which has attracted much attention during recent years, is associated with the sex of the fetus. Males appear to suffer a higher death-rate than females at every age from conception on. As there are about 105 boy babies born alive to every 100 girl babies, it follows that an excess of boys must be conceived. This excess has been estimated at ratios ranging from 125 : 100 to 200 : 100. The fact that more boys than girls are eliminated indicates not only that boys are subjected to a more stringent selection, but also that they are the less viable or biologically inferior sex. This inferiority is believed by most biologists to be an inescapable result of their sex. It manifests itself in sex-limited defects that are an outgrowth of the physical constitution (thus boy babies suffer severely from inguinal hernia, whereas girls because of their sex-differentiation have no corresponding defect), and in sex-linked defects that are the result of the difference in chromosome constitution of the two sexes. The heavy intra-uterine selection is not enough to offset this weakness, for it persists throughout life—more males than females die at almost every age (partly because of greater exposure to accidental risks), and there are more long-lived women than long-lived men.

In sum, the intensity of natural selection is great in the uterine period, it is associated with chromosome balance,<sup>49</sup> it eliminates most of the grossly defective conceptions, and it tells much more heavily on the male than on the female sex.

2. Birth provides a critical period in the life of the individual, since he is subjected to selection not only in proportion to his own ability to meet the change of environment, but also to selection on the basis of his mother's ability to have a normal delivery—not to mention the less selective but often highly important factor of skill on the part of the attending obstetrician or midwife. Like the intra-uterine death-rate, that at the time of the birth (the neonatal death-rate) has shown little improvement in recent years,<sup>23</sup>—again suggesting that the intensity of natural selection here is little diminished.

The true extent of infant mortality is unknown, however, because the figures are so much affected by differences in the extent to which births are reported. In most communities, at least until recently, registration of births has been defective. For a quarter of a century the Census Bureau and other organizations have been making great efforts to get communities to register births fully and promptly. Under the most favorable conditions, however, deaths, which involve an undertaker, a burial permit, and some publicity, are probably reported much more fully than births, which often occur in the privacy of the home.

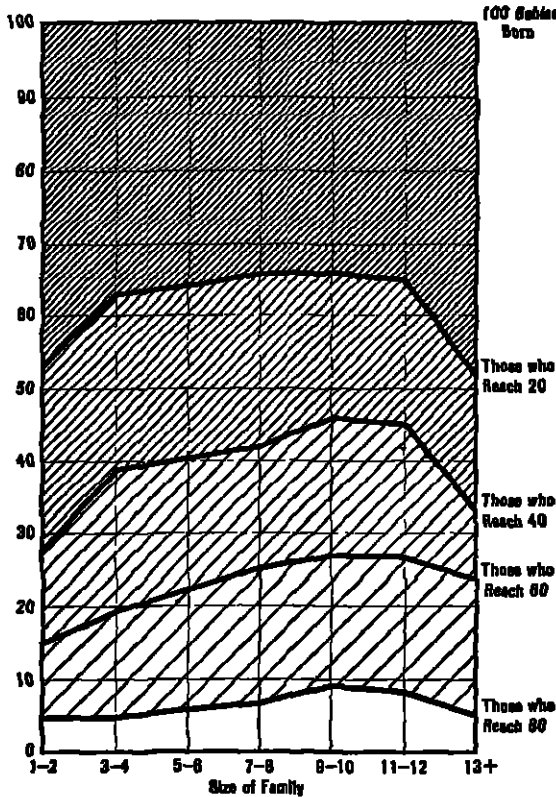
The infant mortality rate is a fraction representing the ratio of deaths under one year to 1,000 births. At the present time it is in the neighborhood of 70—that is, about 7% of the children who are born will die within the first year (mostly within the first week). Now suppose, to take a numerical illustration, that the registration of births in a given community is only 80% complete when the infant mortality rate is reported as 70 : 1000, and that by an intensive drive the health authorities succeed in bringing the registration up to par. Then the infant mortality rate will be 70 : 1250, because more births will be reported, but not more deaths (they were reported fully before). Transposed to the usual base of 1,000, this gives an infant mortality rate of 56 instead of 70, and the newspapers immediately take great credit for their community, because the activities of its Department of Health have reduced the

infant mortality rate below that of the rest of the country. As a fact, however, there has not been a single change in deaths; simply an increased efficiency in reporting births.

*In one degree or another, this is exactly what has been going on.* The "infant mortality rate" in the United States has been cut in two in about 25 years, but how much of this is due to the fact that more babies are being saved, and how much of it is merely an arithmetical change due to better birth-reporting, no one can say. Probably the latter variable is more important than the former.

Lethal selection is more intense in the first year of life than at any subsequent period, but at best it is much less important than reproductive selection. Suppose that 70 represents a genuine infant mortality rate and that by actual reduction in infant mortality this is reduced to a genuine rate of 35—a rate which probably could not be maintained over any length of time in a civilized community. Then the net gain to the race is 3% or 4%; whereas an increase in average size of family from three children to four children would be an increase of one-third, that is, 10 times as important as the greatest possible decrease in infant mortality that could be expected. Similarly, a decline in the average size of family from three to two children (which is actually taking place at the present time in large strata of the population) again will be 10 times as important, in changing the make-up of the race, as any change that could be made in the infant mortality rate. These numerical illustrations are chosen arbitrarily, simply to make clear that reproductive, rather than lethal, selection is the key to eugenic progress, and that those who hope to solve the problem by focusing attention on a "Save the Babies" campaign have not considered the possibilities. If the babies can be saved, it is important to do so for every reason; but eugenically *some of them who are being saved by special effort are inherently weaker than the average and therefore may not represent much of a net gain, as will be pointed out more fully in the next section.*

Diseases of the digestive tract have been brought under control more successfully than diseases of the respiratory tract



THE HISTORY OF 100 BABIES

FIG. 23.—The top of the diagram shows the children starting "from scratch." By following down the vertical lines, one can see that their longevity is associated with the size of family from which they come. Those who had 10 or a dozen brothers and sisters are most likely to live to an extreme old age. Alexander Graham Bell's data, 2964 members of the Hyde family in America

with the frequent complication of pneumonia; but a large part of the infant deaths seems to be due to congenitally weak constitutions, and is therefore particularly selective. Different

groups living under similar environmental conditions may present marked differences in immunity, due to the selective elimination of weak strains that has occurred previously. Different racial groups show different rates of infant mortality in the United States, which are roughly parallel with the rates in the countries from which the groups came.<sup>135</sup>

Among the causes of death at birth, the most important are birth injury and prematurity. The causes of the latter are somewhat obscure. The American returns may include many deaths under this heading which are really due to criminal abortion. Avoidance of birth injury depends largely upon proper care of pregnant women before delivery, and the training of obstetricians to avoid undue interference with the processes of nature. Many still-births and early deaths are due to congenital syphilis which is one cause, at least, that can be eliminated by a thoroughgoing campaign of preventive medicine.

If the male sex is the less viable, as was suggested in the preceding section, then the sex ratio provides a rough index of the selective nature of the death-rate, for it will vary according to the intensity of selection. Figures from many countries show that when the infant mortality rate is high, it tends to fall more equally on the two sexes. When it is low, and in proportion as it decreases, there is a relatively high mortality of males. If one assumes that the conditions for every newborn baby were made as perfect as possible, then under those conditions one would expect to find the maximum mortality of males proportional to females, for the latter are more able to profit by good conditions, while the former, as the weaker sex, contain more members who are certain to die no matter how much care is given to them.

This fact, together with the fact already mentioned that the mortality of the newborn has really shown very little change in the last quarter of a century, no matter what improvements have been claimed in the infant mortality rate, indicates that the selective death-rate at and shortly after birth is high—in other words, that of those who die at that period, a large pro-

portion die because of inherent defects, weak constitutions, and germinal unfitness. Eugenically, therefore, their loss represents a smaller loss to the race than would a similar number of non-selective deaths such as would be more nearly found if the deaths were due to an earthquake, a tidal wave, or the explosion of a munitions factory—lethal factors that affect all in a given area, the inherently strong as well as the inherently weak.

3. The childhood death-rate is closely associated with that of infancy. A high death-rate in infancy commonly means a lower death-rate in childhood (which for the present purpose means the second, third, fourth, and fifth years of life). A low death-rate in infancy means a higher death-rate in childhood.<sup>125</sup>

This relationship has been found in a number of different countries, though it is not easy to measure because of the tendency of people to move about and thereby make it difficult to follow the mortality statistics. The only serious study which has not borne out this conclusion is, indeed, one made in Chicago.<sup>37</sup> But if the people of Chicago move as frequently as they do in New York, where the gas company reports that the average family changes its address every two years, it is evident that the mortality figures in a given ward in, say, the year 1920 might have no connection with those for the same ward in, say, 1922 or 1924; because in each case the population would have changed markedly in the intervening years.

For the present it seems established that a low death-rate in the first year of life leaves that many more inherently weak children, some of whom are certain to die within the next four years; while a high rate of infant mortality will eliminate a larger proportion of the weak children, so that there are not so many of them left to die in childhood. A high death-rate in infancy, if associated with widespread infectious disease, may also tend to produce a lower child death-rate through immunity produced among the survivors, but it does not seem probable that this can explain the difference entirely, because child death-rates are also found to be associated with adult death-rates,

and therefore reflect the kind of constitution that the child has inherited.

It is known from many studies that longevity is inherited to a significant degree. On the whole, it represents one of the best single measures of fitness, of tough and resistant constitution. Alexander Graham Bell collected histories of families in which at least one member had lived to the age of 90 or more.<sup>123</sup> The child mortality (in this case during the first four years of life) was as follows:

SIZE OF FAMILY	NO OF FAMILIES INVESTIGATED	NO OF FAMILIES SHOWING DEATHS UNDER 5 YEARS	TOTAL NO OF DEATHS
1 child	6	0	0
2 children	6	0	0
3 "	38	4	5
4 "	40	6	7
5 "	38	4	4
6 "	44	12	13
7 "	34	8	11
8 "	46	13	18
9 "	31	14	20
10 "	27	14	14
11 "	13	6	9
12 "	13	9	16
13 "	1	0	0
14 "	2	0	0
17 "	1	1	2
	<u>340</u>	<u>91</u>	<u>119</u>

In these families, it will be noticed, the mortality during the first four years of life was much smaller than it is in the United States as a whole, for the first year of life alone. Yet these were not families particularly favored by society. Most of them had lived in a hard environment. They appear to belong predominantly to the lower strata of society; many of the parents were immigrants and only a few of them, to judge by a cursory inspection of the records, possessed more than moderate means. Most of the records go back a generation or two, prior to the development of "baby saving campaigns" and to a time when the general infant mortality rate was two or three times as high as it is now. One can hardly question the fact



that this low rate of mortality in childhood was due mainly to sound inheritance, rather than to favorable environment.

If favorable environment were the main factor, it should be demonstrated in the royal and princely families of Europe, where every child has had the advantage of the best care that the state of science at the time of his birth could furnish. Yet here the data <sup>125</sup> again show a close relationship between the length of the father's life and the child mortality. If the parent was short lived, the child evidently inherited the same weak constitution, and his own expectation of life was not so good.

LENGTH OF LIFE OF FATHERS AND CHILD-MORTALITY OF THEIR CHILDREN  
IN ROYAL AND PRINCELY FAMILIES (Ploetz' Data)

	YEAR OF LIFE IN WHICH FATHERS DIED								AT ALL AGES
	18-25	26-35	36-45	46-55	56-65	66-75	76-85	86 UP	
No of children	23	90	367	545	725	938	444	33	3,210
No. who died in first 5 years	12	29	115	171	200	254	105	1	887
Per cent who died	52.2	32.2	31.3	31.4	27.6	25.8	23.6	30	27.6

It must be clearly understood that not all the infant and child mortality is selective and that, even if it were, this is not the most desirable method of race betterment at the present time, for it has too many disadvantages. Infant mortality should be reduced to the lowest levels possible, and reproductive selection rather than lethal selection should be depended upon to provide for the improvement of the national stock.

4. Adolescence represents the period of lowest death-rate, and probably also of lowest selective death-rate.

5. Adult life shows highly selective death-rates, but these are in many instances less important than selection in infancy or childhood, because the individual may have had time to produce a family before he dies. On the other hand, it is easier to see what the individual's constitution is in adult life, and the nature of the selection involved can therefore be recognized more easily. With infant mortality one must infer, from a

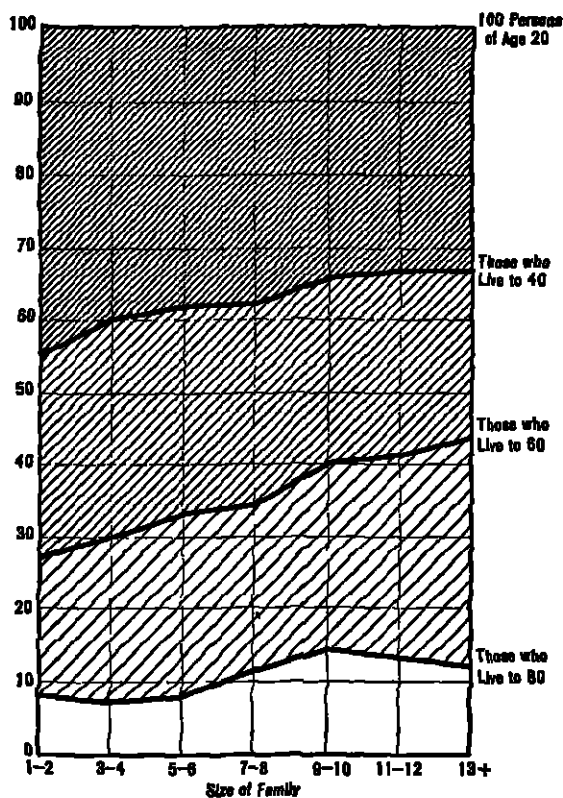
knowledge of the parents, what kind of strains are being eliminated through the deaths of certain infants, and since heredity rarely means perfect resemblance between parent and offspring, such inference is necessarily subject to a wide margin of error.

Of infectious diseases, tuberculosis has had particular attention because of its widespread distribution and the high mortality for which it is responsible. Postmortems, however, show that under urban conditions, where crowding makes for a maximum possibility of infection, virtually every one who lives beyond adolescence has been infected with tuberculosis. In most persons the germs in the lungs or elsewhere find their growth soon checked by the protective forces of the body, so that the individual does not even know that he contains them; in some the infected area increases until it causes death.

Why does one man thus die of tuberculosis while his friends, who are also infected, resist it? A common explanation is that resistance depends on the age at infection. Those infected very early in life, with small numbers of the bacillus, will gradually develop a resistance to it. Those infected suddenly with larger doses will find their protective mechanisms overpowered, and will succumb.

On the other hand it may be argued that, since the constitution varies in every other respect, it probably varies likewise in its ability to resist tuberculous infection; and that, since every one is infected, those who survive are likely to be those with the strongest natural immunity; those who go under are likely to be those with the lowest biological resistance.

Presumably there may be some truth in each of these theories. Most of the observed facts of mortality can be fitted to either one of them. Thus the American Indians were found to be particularly susceptible to tuberculosis, which was brought by the early discoverers and colonizers. Such diseases as tuberculosis, smallpox, measles, and influenza killed off many more of the natives than did the wars with the conquerors. On the one hand it is argued that they had not been exposed



## ADULT MORTALITY

FIG 24.—If child mortality is eliminated and only those individuals studied who lived to manhood (age of 20 or more), the smaller families are still found to be handicapped. In general, it may be said that the larger the family, the longer an individual member of it is likely to live. Large families (in a normal, healthy section of the population) indicate vitality on the part of the parents, which is inheritable by their offspring. This does not, of course, hold good in every slum population, where mental, physical, and financial inefficiency abound. Within certain classes, however, it may be said with confidence that the weaklings of a population are most likely to come from the smaller families. Alexander Graham Bell's data (Hyde family).

to the disease in earlier life, so that when they were exposed, it was to sudden and massive infection, which the best constitutions could not withstand. On the other hand it is argued that, since they had not been subjected to selection against tuberculosis in their earlier racial history, the weak strains had not been eliminated and the whole population showed a relatively low resistance, while the invaders, whose ancestors had been exposed to the ravages of tuberculosis for thousands of years, represented the survivors of many generations of natural selection, in each of which the less resistant had died and the more resistant had been more likely to leave offspring who would, in turn, inherit their higher natural resistance.

On the whole, the second of these explanations, which assumes the existence of inherited variations in resistance and the importance of a selective death-rate, fits all the facts brought forth and seems to be more in accord with the general principles of biology than does an exclusive reliance on the first mentioned. It receives strong support from laboratory experiments in which highly inbred strains of guinea-pigs, differing in heredity but with the same environment and the same sort of (artificial) infection, have been found to differ greatly in their resistance to the bacillus.<sup>174</sup> This resistance seems in this case to be a function of the inheritance, and not a function of general vigor. Indeed, some of the guinea-pig families that had the lowest general vitality were most resistant to tuberculosis; some of those that made the best showing in general vigor had a low resistance to this particular infection.

More detailed studies<sup>125</sup> of tuberculosis in human families show that there is a much closer resemblance between parent and offspring in respect to the infection, than there is between husband and wife, although the latter share the same bed and are in general more intimately associated than are father and son, and that the correlation between liability to tuberculosis and destitution—which necessarily includes most of the evils popularly associated with tuberculosis, such as overcrowding, malnutrition, and lack of personal hygiene—is negligible.

These facts point toward the importance of inherited resistance.

The death-rate from tuberculosis in the United States has been declining for many years. It was particularly high in the first few decades after 1840. The Irish were at that time emigrating in such numbers that within a generation about two-fifths of the entire population of Ireland had moved to the United States. As a group they had and still have a notably high death-rate from tuberculosis, and their presence here seems to be associated with the great increase in the death-rate in 1840-1850. Since then the rate has been decreasing, as the more susceptible strains died out. The world-wide influenza pandemic that coincided with the World War—the greatest visitation of the kind since the historic plagues of the middle ages—took 20,000,000 lives. Many of these deaths were from pneumonia growing out of the influenza, and particularly striking those with weak lungs. In this way many more persons were carried off who, had they lived, might have fallen victims to tuberculosis, so that the death-rate from the latter has since been still further reduced, until it is now relatively low in the United States.

This view, which ascribes the decrease in the prevalence of tuberculosis partly to natural selection—that is, to the elimination of the weaker strains—instead of wholly to improved hygiene and sanitation and a special crusade against the White Plague, is not to be misinterpreted as warranting any disregard of ordinary sanitation and personal hygiene. Since natural resistance varies, it is evident that one who may have sufficient resistance to fight off the omnipresent invaders under favorable conditions may succumb if he does not take good care of himself. Nevertheless, with a death-rate as high as existed in the United States 50 or 75 years ago, it seems probable that the most susceptible strains were being eliminated continually and rapidly, and that the death-rate would therefore have fallen steadily (though doubtless more slowly) even if there had been no special anti-tuberculosis campaign.

On the whole, tuberculosis seems to select for elimination those who have just one peculiarity, namely, a low natural resistance to tuberculosis. It does not select, to a marked degree, persons who differ from the average in any particular mental or emotional qualities, or in other important physical characteristics. (Contrary to a widespread impression, it is not a flat chest but a barrel chest, suggestive of the proportions of the newborn baby, that is particularly liable to fatal attack.) In other words, susceptibility or immunity to tuberculosis is not correlated markedly with other characteristics of eugenic importance, and the effect of natural selection in this respect is to direct the evolution of the race merely toward greater resistance to the growth of this particular bacillus.

In contrast to this, syphilis, which is a killer of the same order of magnitude, tends to select victims that have a number of important peculiarities. In other words, susceptibility to syphilis is correlated markedly with many other important characteristics. This is not so much a physiological relationship as a psychological one. Due to the fact that syphilis is usually contracted through sexual relations outside of marriage, it tends to eliminate those persons who, for any reason, are more likely than the average to have sexual relations outside of marriage. Most of the deaths from syphilis occur either at the beginning of life, this disease being one of the common causes of still-births and miscarriages, or else fairly late in life, after the victim has had time to marry and have children. It is, therefore, an important factor in the mortality of the uterine period, but its selective action later in life is more reproductive than lethal. In general, the selective action of the disease is favorable to the perpetuation of strains endowed with altruism, self-control, idealism, and intelligence. It tends to eliminate some of the mentally deficient and mentally diseased, and also those lacking in self-control. It probably tends also to eliminate strains marked by unusually strong sexual impulses, particularly when these are associated with feeble inhibitions, emotional instability, and in the male a tendency

toward aggressiveness, domination, and a predatory nature. In so far as these various characteristics have germinal bases, the spread of syphilis may bring about relatively marked changes in the make-up of a population in the course of a few hundred years.

Due to the particular social conditions surrounding infection, syphilis is almost in a class by itself. (The other important venereal disease, gonorrhea, shares the same peculiarities, but as it produces its racial effects through sterility rather than through death, a discussion of it belongs in the next chapter under reproductive selection.) Most infectious diseases, and particularly the acute ones such as smallpox, cholera, typhus, yellow fever, bubonic plague, are to be classed with tuberculosis as tending to eliminate principally those strains which lack a specific resistance. Doubtless they do to a small extent eliminate strains lacking in prudence, intelligence, and good habits, but any valuable effect in this way is largely offset by the elimination of strains valuable socially but weak merely in the one respect of disease resistance. Much is to be gained, therefore, by eliminating them, if it can be done, and depending on more discriminating measures for the improvement of mankind.

Narcotics are to be classed more nearly with the venereal diseases in that they produce an important social selection. By far the most important of these is alcohol, and a consideration of it will show the lines along which any other case may be analyzed. Drinkers regularly have higher death-rates than abstainers.<sup>26</sup> Apparently there is no specific resistance or susceptibility to the effects of alcohol, as there is to tuberculosis, but any weak nervous system is susceptible to this or other poisons, roughly in proportion to its weakness. Those who "drink themselves to death," therefore, represent persons with weak nervous systems, and alcohol represents a powerful agent of natural selection. The real extent of deaths from this source is unknown, because, as with syphilis, it is not considered good form for a physician to state the real cause of death. Moreover, the figures have probably varied a good deal in the United

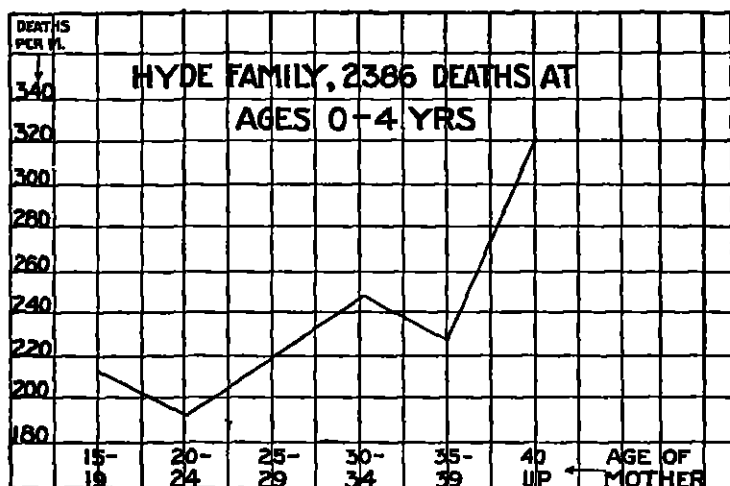
States during the last generation in accordance with the spread of prohibition and of drinking habits. In Switzerland, where alcoholic beverages have been long, widely, and openly used and where the mortality statistics are thought to be more reliable than the average, alcohol figures as a prime or contributing cause in about 10% of the deaths.<sup>6</sup> While many of its victims have otherwise desirable qualities, the possession of a strong and stable nervous system is so desirable in modern civilization that the elimination of such defectives is probably advantageous in the long run. However, it could be brought about by more discriminating, socially controlled, eugenic measures, without the great social and economic losses involved in the widespread use of alcoholic beverages.

Climate acts as a selective agent largely through infectious diseases, and it has often been argued that the white race might easily colonize the tropics when these diseases are conquered. Against this, it is claimed that no people who were largely of Nordic make-up have ever established permanent settlements in extreme tropical regions. The nearest to a permanent and successful colonization of this sort is perhaps to be found in Barbados, settled by a little group of English, largely royalist refugees, in the second quarter of the seventeenth century. In the ensuing 300 years this population has not only held its ground, but is at the present time producing a higher average of ability than most white populations in the temperate zones.

However, this group may have survived owing to the presence of a large Negro population which has done the manual labor. Since the Negro is provided with various adaptations to withstand a tropical climate, such as a much larger number of sweat glands per square inch of skin than has the white man,<sup>120</sup> it is probable that he has become better fitted by thousands of years of natural selection, to withstand the extreme climates of the tropics, than is the white. In the absence of any large body of convincing evidence on this important subject, climate must be regarded as probably an important agent in selection.



Accidents, which occur with such frequency in a machine civilization, doubtless play an important part in promoting the survival of the prudent, and those with sound muscles and good nervous control. They take a proportionately heavy toll from the reckless, the incompetent, and the alcoholic. Auto-



INFLUENCE OF MOTHER'S AGE

FIG. 25.—As measured by the percentage of infant deaths, those children show the greatest vitality who were born to mothers between the ages of 20 and 25. Infant mortality increases steadily as the mother grows older. In this case the youngest mothers (those under 20) do not make quite as good a showing as those who are a little older, but in other studies the youngest mothers have made excellent records, so far as physical aspects of reproduction are concerned. Alexander Graham Bell's data.

mobile accidents alone account for not far from 100 deaths a day in the United States, of which about one-half are those of children.

War is so important in natural selection that it deserves separate treatment and is therefore considered more fully in Chapter XII.

Suicide is relatively unimportant, though about 20,000 persons each year are affected, because they are mostly too old

to be of eugenic significance. Many of those who commit suicide are to be credited to the mentally diseased part of the population, and if they could make way with themselves 20 or 30 years earlier, their demise might be a eugenic gain. But most of them have lived long enough to have children, if they would do so at all.

Maternal mortality<sup>98</sup> is likewise a relatively unimportant item. About 15,000 deaths each year are credited to this cause in the United States, but at least one-third of them do not belong under this heading, because they are really the results of criminal abortion, and therefore normal childbirth should not be charged with them. This type of mortality particularly tends to eliminate strains that show kidney defects; also those with narrow pelvis and other structural peculiarities. Abortions, on the other hand, tend to eliminate certain psychological strains, particularly those with less desire for children.

Summarizing,<sup>119</sup> one must recognize that the changes in the death-rates are by no means as favorable to mankind as is often supposed. A decline in the real rate of infant mortality is partly offset by a rise in the rate of child mortality. The changes in the adult death-rates are also illusory. Speaking broadly, it may be said that the tendency in recent decades has been toward a decline in adult deaths due to infectious diseases and an increase in adult deaths due to degenerative diseases. Both these trends seem to be increasing. The increase in the death-rate from diabetes has been particularly great.

To bring about a decline in the death-rate from infectious diseases is, theoretically, not very difficult. It involves such theoretically simple measures as the extermination of a certain species of mosquito, or the destruction within the human body of a certain type of microorganism. A continued gain in the war against such diseases might be expected for a long time to come, although in any case a point must eventually be reached when the rate of gain will become small, or disappear. In favorable cases, this will coincide with the disappearance of the disease from the face of the earth.

The conquest of degenerative diseases is theoretically more difficult, for it can not be brought about by any simple vaccination. It must be based largely on a change in the living habits of the race, and it is not so easy to get a middle-aged business man to stop eating and start exercising as it is to clear the hookworms out of his system or to immunize him against diphtheria. Conditions appear to be getting worse, rather than better, in respect to some of the biologic habits. While such palliatives as insulin may relieve his sufferings, they are, from an evolutionary point of view, merely palliatives. If they change the constitutional make-up of the race, it is likely not to be for the better, since the result is the survival and possible reproduction of persons with weak resistance.

There is, then, no reason to think that the average span of life will be materially lengthened in the near future, and writers who describe the near-by millenium when people will live to be 200 years old and will be at the height of their powers when they reach the end of the first century have no adequate grounds for their position. While the baby at birth has a longer expectation of life than he used to have, the man or woman of middle age has a shorter expectation of life than he used to have." The continued progress of science finds its counterpoise in the continuing decline of man's inherent fitness.

## CHAPTER VI

### NATURAL SELECTION

#### 2. REPRODUCTIVE

Selection operates through differences in the birth-rate brought about either by the fact that some marry less favorably than others, or not at all (sexual selection), or that of those who marry, some have more children than others (fecundal selection). The present chapter discusses these in turn.

"Love is blind" and "Marriage is a lottery" in the opinion of proverbial lore. But as usual the proverbs do not tell the whole truth. Mating is not wholly a matter of chance; there always has been some selection involved. This selection must be, of course, with respect to individual traits, a man or woman being for this purpose merely the sum of his or her traits. Reflection shows that with respect to any given trait there are three ways of mating: random, assortative, and preferential.

1. Random mating is described by J. Arthur Harris <sup>26</sup> as follows:

"Suppose a most highly refined socialistic community should set about to equalize as nearly as possible not only men's labor and their recompense, but the quality of their wives. It would never do to allow individuals to select their own partners—superior cunning might result in some having mates above the average desirability, which would be socially unfair!

"The method adopted would be to write the names of an equal number of men and women officially condemned to matrimony on cards, and to place those for men in one lottery wheel and those for women in another. The drawing of a pair of cards, one from each wheel, would then replace the 'present wasteful system' of 'competitive' courtship. If the cards were thoroughly shuffled and the drawings perfectly at random, we should ex-

pect only chance resemblances between husband and wife for age, stature, eye and hair color, temper and so on; in the long run, a wife would resemble her husband no more than the husband of some other woman. In this case, the mathematician can give us a coefficient of resemblance, or of assortative mating, which we write as zero. The other extreme would be the state of affairs in which men of a certain type (that is to say, men differing from the general average by a definite amount) always chose wives of the same type; the resemblance would then be perfect and the correlation, as we call it, would be expressed by a coefficient of 1."

Actual measurement of various traits in conjugal pairs shows that mating is very rarely random. There is a conscious or unconscious selection for certain traits, and this selection involves other traits because of the general correlation of traits in an individual. Random mating, therefore, is unimportant to eugenists, who must rather give their attention to one of the two forms of non-random mating, namely, assortative and preferential.

2. If men who were above the average height always selected as brides women who were equally above the average height and short men selected similarly, the coefficient of correlation between height in husbands and wives would be 1, and there would thus be perfect assortative mating. If only one-half of the men who differed from the average height always married women who similarly differed and the other half married at random, there would be assortative mating for height, but it would not be perfect: the coefficient would only be half as great as in the first case, or .5. If on the other hand (as is indeed the popular idea) a tall man tended to marry a woman who was shorter than the average, the coefficient of correlation would be less than 0; it would have some negative value.

Actual measurement shows that a man who exceeds the average height by a given amount will most frequently marry a woman who exceeds the average by a little more than one-fourth as much as her husband does. There is thus assortative

mating for height, but it is far from perfect. The actual coefficient given by Karl Pearson is .28. In this case, then, the idea that "unlikes attract" is found to be the reverse of the truth.

If other traits are measured, assortative mating will again be found. Whether it be eye color, hair color, general health, intelligence, longevity, insanity, or congenital deafness, exact measurements show that a man and his wife, though not related by blood, actually resemble each other as much as do uncle and niece, or first cousins.

In some cases assortative mating is conscious, as when two congenitally deaf persons are drawn together by their common affliction and mutual possession of the sign language. But in the greater number of cases it is wholly unconscious. Certainly no one would suppose that a man selects his wife deliberately because her eye color matches his own; much less would he select her on the basis of resemblance in longevity, which can not be known until after both are dead.

Sigmund Freud explains such selection by the supposition that a man's ideal of everything that is lovely in womankind is based on his mother. During his childhood, her attributes stamp themselves on his mind as being the perfect attributes of the female sex; and when he later falls in love it is natural that the woman who most attracts him should be one who resembles his mother. But as he, because of heredity, resembles his mother, there is thus a resemblance between husband and wife. The woman is similarly inspired by ideals of manliness based on her father.

While this supposition is hard to prove, it probably contains some truth, so far as mankind is concerned. It does not, however, explain the general tendency toward assortative mating or homogamy among all living things. When there is found to be a tendency among one-celled animals toward assortative mating based on size, and even a similar tendency in the pollination of plants, one can not explain the situation by a "mother complex." At present it can only be said that homogamy is

one of the widespread phenomena of life, and that it has a variety of causes.

Among human traits, the highest degree of assortative mating has been found to prevail for general intelligence, the coefficients running as high as .60 or .70 in some studies.<sup>80</sup> Eugenically important as this is, it seems to be to some extent indirect, and to be based on a tendency to select in marriage one of like social and economic status, rather than consciously to pick out one of like intelligence. But since intelligence is correlated in some degree with social and economic status, the net effect is to produce assortative mating for intelligence.

That the selection for intelligence is indirect, as thus suggested, is indicated by a study of the marriage of sterilized, mentally deficient girls who came from fairly good families.<sup>123</sup> For these there seemed to be little resemblance between the girl's intelligence and that of her husband; but there was a resemblance between the social and economic status of the husband and that of the girl's father. In other words, it appeared that the young man had chosen a wife partly on the basis of her family status, which would ordinarily produce assortative mating for intelligence, but that he had not realized in this particular instance that the girl was not a fair representative of her family.

The widespread suspicion that men prefer to marry women who are, or who at least appear to be, their intellectual inferiors, seems to be borne out by such slight research as is reported. In a study of about 100 California families the average I. Q. of mothers was 100.2, of fathers 108.0. In another study of 257 families, the husband's I. Q. exceeded that of his wife in two-thirds of the cases. Of course there are many other explanations of this situation. The most intelligent women are the ones most likely to avoid marriage, intentionally or unintentionally, and take up other lines of activity.

3. Preferential mating refers to an increased marriage rate of those who possess some trait to a greater degree. If the preference amounts to 0, the individual does not wed at all.

This is the form of sexual selection made prominent by Charles Darwin, who brought it forward because natural selection, operating solely through a differential death-rate, seemed inadequate to account for many results of evolution. By sexual selection he meant that an individual of one sex, in choosing a mate, is led to select out of several competitors the one who has some particular attribute in a higher degree. The selection may be conscious, and due to the exercise of aesthetic taste, or it may be unconscious, due to the greater degree of excitation produced by the higher degree of some attribute. However the selection takes place, the individual so selected will have an opportunity to transmit his character, in the higher degree in which he possesses it, to his descendants. In this way it was supposed by Darwin that a large proportion of the ornamental characters of living creatures were produced: the tail of the peacock, the mane of the lion, and even the gorgeous coloring of many insects and butterflies. In the early years of Darwinism, the theory of sexual selection was pushed to what now seems an unjustifiable extent. Experiment has often failed to demonstrate any sexual selection, in species where speculation supposed it to exist. And even if sexual selection, conscious or unconscious, could be demonstrated in the lower animals, yet the small percentage of unmated individuals indicates that its importance in evolution was not as great as postulated.

In the human species, however, there is—nowadays at least—a considerable percentage of unmated individuals. While 10% of the whole population never marries, the percentage is much larger in certain groups. If these unmated individuals differ in any important respect from the married part of the population, preferential mating will be evident.

Institutional records at once show this. The prisons, hospitals, and institutions for mental disease are heavily overloaded with unmarried persons of marriageable age (and to a large extent also with divorcees).

Red hair and bad temper both seem to be the basis of dis-



crimination in mating, and certainly not of assortative mating. Two red-headed persons marry each other much more rarely than chance would permit; and the same thing is true of persons given to explosive outbursts of emotion.

Beauty in women, on the other hand, is preferred in mating, and the ugly woman is distinctly handicapped in mate selection, unless she has compensating advantages, such as wealth. This has a eugenic significance in so far as "good looks" are correlated with good health, as evidenced by good eyes, good teeth, good skin, good color, good posture, and so on.

There seems to be little preferential mating for intelligence as such. S. J. Holmes studied the marriage records of University of California graduates,<sup>9</sup> compared these records with their marks in the classroom, and found that an uninterrupted row of A's did not make one any more likely to marry early than did a line of C's and D's. In fact, extremely high scholarship in women seems to be a deterrent to marriage or associated with something that is a deterrent.

Vivacity in women is attractive to men and within limits the effect of preferential mating for this trait is eugenic, since the discrimination against shy, indifferent, and introverted women would bar a certain number who are emotionally abnormal and perhaps even likely to be affected later by dementia praecox. But excessive vivacity is often admired, though it may be found to be associated with an unstable nervous system of another kind, or with abnormality of the thyroid gland, and therefore to be unfavorable.

Sexual normality is one of the factors which seems strongly to favor early marriage in women.<sup>1</sup> So far as this is correlated with general good health, good intelligence, and fertility, it is distinctly eugenic. Women who are defective in normal development of the reproductive system are likely to marry late, when they would have less time for reproduction, anyway; and the smaller number of their children therefore helps to keep up the reproductive effectiveness of the race, in so far as this is germinal. When, however, the reproductive abnormality is

due to the faulty education of superior girls, the situation calls for a modification of that education.

It will be noted that in these cases the effect of selection has been particularly marked as to women, rather than men. It appears that the female sex is in general subjected to more stringent sexual selection than is the male. This is unfortunate for, if the male is biologically more subject to defects, it would be desirable to eliminate these by a more stringent selection.

There are at least 105 boys born to every 100 girls, in most civilized countries. The male death-rate is higher at almost every age and this, together with wastage through war and other preventable causes, brings about in adult years an excess of females. This is masked in the United States by the results of immigration, males outnumbering females among the arrivals from most countries. The United States therefore has an excess of males. According to the 1930 census, the population over 15 years of age contained 43,881,021 males and 42,837,149 females. With such a ratio, every eligible female ought to be able to marry, and (ideally) the surplus of males ought to be composed of the defectives. To a large extent it is so, but still not to a sufficient degree.

Moreover, the census showed 2,025,036 widowers and 4,734,207 widows. This excess of two and a half million widows indicates that many men who are widowed are remarrying, but are taking as their second wives unmarried and probably younger women.

From another point of view, any reader can probably think of a large number of women over 30 who are unmarried but who would apparently make excellent wives and mothers. He will probably be able to think of very few unmarried men over 30 who would apparently make excellent husbands and fathers. Most of the men in this group are discards or handicapped. Yet in spite of these drawbacks they are still much more likely to marry than are the women over 30. L. I. Dublin's figures show that for an unmarried man of 30, the chance of surviving

five years longer and of marrying in the interval is 1 : 2, while for the corresponding woman the chance is 1 : 4.

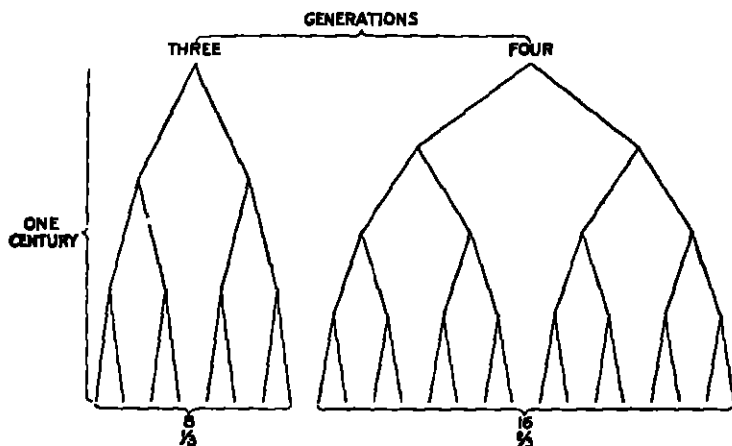
Women of this age frequently ask, "Where are the men who would be desirable husbands?" The answer is that good men are scarce at any time, and that the best of them are already married. The girl who, from choice or inadvertence or necessity, delays her marriage much past 25 is therefore severely handicapped in her range of selection of a mate, and this is particularly true if she is an educated girl with high standards.

Speaking broadly, it may be said that the general tendency toward assortative mating which is based on intelligence and social status is reduced by preferential mating. For this reason, women in the lower levels have an unfair advantage, women in the higher levels receive a handicap.

Many of the girls in the lower levels are marrying above their natural level. The daughter of a taxicab driver or street-car conductor gets a job as a stenographer, let us say. She is obliged to dress well and keep up appearances; she associates with men who, for the most part, are distinctly above her family level, and, reasonably enough, she becomes ambitious for such a mate. The men whom she would naturally marry are the associates of her brothers; but these men come home from dirty jobs, with grease under their fingernails. She looks down on them and, by virtue of her own strategy and with the assistance of the propinquity factor, she finally marries a man of a higher socio-economic status.

The same process is repeated all the way up the scale, with the result that there is a displacement or lack of congruity between the two series of men and women, and the women in the top group are left without mates. The solution seems to be, on the one hand, to educate men to be more discriminating, and, on the other hand, to give the superior women an education that will be more effective for marriage and to give them more favorable opportunities for meeting men of their own type. These points will be taken up in Chapter XIV.

At present, propinquity is an unduly large factor in choice. A study <sup>11</sup> of 5,000 marriage licenses issued in Philadelphia revealed that more than half of the men were choosing brides who lived within two miles of them. In one-eighth of the marriages the couple lived at the same address; in one-third they



THE EFFECT OF LATE MARRIAGES

FIG 26—Given a population divided in two equal parts, one of which produces a new generation every 25 years, the other every 33 1/2 years, the diagram shows that the former will outnumber the latter two to one, at the end of a century. The result illustrated is actually taking place, as between various groups in the population of the United States at the present time. Largely for economic and educational reasons, many superior people postpone the age of marriage. The diagram shows graphically how rapidly their stock will lose ground, as compared with those which marry only a few years earlier, on the average. It is assumed in the diagram that the two groups contain equal numbers of the two sexes, that all persons in each group marry, and that each marriage produces four children.

lived not more than five blocks apart. With modern rapid transit, propinquity acts with larger residential distances but is still an effective factor.

In summary: (1) preferential and assortative mating are often in operation at the same time, the former affecting the case of an individual mating, the latter affecting a whole group;

(2) men's selection of mates is more stringent than women's selection of mates, which, from a eugenic point of view, is an undesirable situation.

So much for sexual selection. While it is of the greatest importance to the individual, its importance as a factor in evolution is much less than that of fecundal selection, which will now be discussed.

The number of children required to keep a group from declining in numbers is often not understood by the public. There is even a common idea that if parents bring up two children to adult years, they have replaced themselves. This is not at all true, for it makes no allowance for failure to marry or to have children in marriage in the next generation. The exact number of children needed to keep a population stationary in numbers depends on birth, death, and marriage rates. The following calculations, using certain assumptions as to these rates, show the difference between marriages that produce two children each and those that produce four children each.

We start with 1,000 mothers, who have two children each, a total of 2,000 children. Of these about 950 will be daughters, of whom say 10% will die before maturity. This leaves 855 daughters, of whom 70% may be expected to marry. This figure (a high one for an educated group of women) leaves 618.5 of the daughters married, of whom 80% will have children. This is 494.4 mothers in the next generation, to replace the 1,000 mothers of this generation, with whom the calculation started. The assumptions made have not been far out of line with the facts in the educated part of the population at the present time. Under them, it is clear that a part of the population which has only two children per marriage will diminish by more than one-half in each generation.

Starting with a four-child family, we have 1,900 daughters produced by the original 1,000 mothers. If 90% of these daughters survive, they will number 1,710, of whom 70% will marry. This reduces the number to 1,197 of whom 80% are expected to have children, that is 957 mothers in the next generation to

replace 1,000 in this generation. With the marriage and fertility rates of educated women in America, it is evident that even four children per marriage are scarcely sufficient to prevent a group from declining in numbers.

At the present time, of all the gene-combinations that produce conspicuous ability, competence, and leadership in the United States, approximately one-half are being permanently eliminated from evolution in each generation. No war in modern times has been so disastrous as this over any long period of time. "Perhaps a better parallel," R. A. Fisher observes, "is the policy of massacre of the intelligentsia which has been advocated, or practised, from time to time in Soviet Russia! If the Russian intelligentsia have a birth-rate fit only to maintain their numbers they could afford the massacre of one-tenth of their men, women, and children every five years, and still decrease no faster than does the intelligentsia in this country, or in any civilized country."

Differences in the number of children contributed to the next generation vary from family to family and are associated with many other conditions. These conditions are in turn associated with each other, in complicated relationships. For the sake of examination, it is necessary here to consider them separately.

1. Age at marriage is perhaps more important than any other one factor in promoting the increase of some groups over others. Fig 26 shows graphically the rapidity of change. If a population starts in two equal parts, one of which has three generations to the century, the other four, at the end of only one century the first group will make up not half but one-third of the population, the second group not half but two-thirds. Since age of marriage is closely associated with intelligence, amount of education, and social status, relatively late marriages in the part of the population that furnishes nearly all of the leadership of the nation play an important part in diminishing the amount of this leadership. This is true even when the size of family in each group is the same. But it is

often not the same, since the unintelligent may have larger families than the intelligent.

2. If two groups marry at the same ages, the one which spaces its children most widely will be outstripped by the other. In a healthy population which uses no effective means of contraception, the average wife will bear a child every two years. If through the use of contraceptives the children are spaced three, four, or five years apart, the size of family is likely to be smaller by the time the wife reaches the end of her reproductive period. Differences in length of reproductive period and differences in infant mortality influence this situation somewhat as between classes, but not much within a given homogeneous group.

3. The relationship between size of family and intelligence can be measured in two ways. Groups of known low intelligence, say the feeble-minded, can be compared with groups of known high intelligence, say college graduates. The results are highly significant eugenically, but equally complicated in interpretation, since so many variables enter in, and the difference found may be due less to intelligence than to some of the other factors. A second method is to measure the intelligence of parents within a given group.

Studies by the first method are so well known that it is scarcely necessary to rehearse them here. Those of low intelligence have nearly always been found to have larger families than those of high intelligence. A study<sup>110</sup> of pedigrees comprising nearly 6,000 individuals in Vermont showed that when one parent was feeble-minded or insane, or both were, the average number of children was 3.5 "This average excludes those children who died in infancy, still-births, and sex unknown. Including the above, the average is 4.3" In a study<sup>50</sup> made from pedigrees in the files of the Eugenics Record Office, completed families in which the mother was said to be definitely feeble-minded were found to show a gross birth-rate of 6.43 children each. Many of these families doubtless dated from earlier generations when all families were larger. While there

has been a great deal of exaggeration about the prolificacy of the feeble-minded, it can at least be said that all studies made show that their families are large enough to perpetuate the group, and that this is not true of families of college graduates in general.

Studies by the second method,<sup>122</sup> in which the intelligence of individual parents is measured and correlated with the number of their children, have been few. In a supposed random sample of the American population, taken for another purpose but consisting of only 100 families, there was found to be no significant correlation between mother's I.Q. and number of children. In a homogeneous rural group somewhat larger, there was again found to be no significant association between the two variables.

On the other hand, in a small group selected on the basis of feeble-mindedness, the correlation between I.Q. and number of living children was found to be  $-.41$ . In other words, the more defective the woman, the larger her family.

The great bulk of the studies made on the association between intelligence and size of family have not followed either of the two methods mentioned, but have approached the subject indirectly by taking the intelligence of a single child, usually one in a school or an institution, and then inquiring how many brothers and sisters he had. While this is far from satisfactory, it does give some data of value eugenically, since the intelligence of a child is correlated to that of a parent to the extent of .50, as already pointed out in Chapter III.

Many such studies<sup>122</sup> agree in showing a correlation of about  $-.20$  between a child's intelligence and the size of the family to which he belongs. This seems to be true even in a homogeneous group, as among coal miners. Such a correlation, though unimportant in many individual cases, is large enough to be an extremely important factor in natural selection, where an advantage as small as .05 is enough to enable a character to spread steadily.

A good illustration of this type of study is the one<sup>27</sup> made on



10,455 retarded children in the public schools of Massachusetts. The completed family from which a child of the lower levels of intelligence came was twice as large as that which produced a child of the upper levels of intelligence. In the families that produced at least one retarded child each, the number of children ever born was  $6\frac{1}{2}$  for the native-born parents,  $7\frac{1}{2}$  for the foreign-born parents.

Fecundity varies not merely with the general level of intelligence, as measured by the I Q., but with perturbations of that level. Thus alcoholics commonly have larger families than the average. Presumably under the influence of drink they fail to prevent conception as they otherwise would. The result is the multiplication of strains in which emotional instability is prominent.

4. Social status in the United States is so closely related to intelligence and to economic status that it is difficult to consider separately. Some interesting studies have been made in the Old World. Royal families are usually large, because of the desire for heirs and other advantages to be gained. On the whole, the fertility of the upper nobility is superior to that of the French, English, American, and Prussian middle classes. Contrary to what is often asserted, aristocracies do not necessarily tend to die out rapidly.<sup>171</sup>

5. Education has an influence on the birth-rate through the establishment of standards of living, through delayed age of marriage, and through the creation of attitudes. At present the attitudes of American college students often seem to approve a number of offspring too small to perpetuate the group.<sup>127</sup> This is not wholly a new phenomenon, for if a study of college graduates in the Eastern United States be extended over a period of two centuries, it is found that they have more childless marriages and fewer children than the average of the population.<sup>130</sup>

It has often been argued that the small families of college graduates are not associated with education, but simply a manifestation of the ideals and customs of the class from which the students come. This, however, proves to be untrue. Over a

period of 80 years, college graduates were found <sup>130</sup> consistently to have fewer children than their non-college cousins and also than their non-college brothers. The difference is apparently more influenced by age of marriage than by any other one factor,<sup>12</sup> the longer education tending to delay marriage several years beyond that of the friends and relatives who do not finish college

In China the reverse tendency exists <sup>51</sup> Education increases the number of living children. Among the Mormons, also, education seems to have little adverse effect on the birth-rate.<sup>14</sup> But in the general population of the United States, it has been found that college graduates will, on the whole, not leave enough offspring behind to replace them. S. J. Holmes' data show that the tendency toward small families in educated households has spread downward from the colleges to the high schools.<sup>4</sup> The main difference is not now between families with college education and those with high school education, but between those with high school or college education and those with only an elementary school education.

It is sometimes argued that even though educated people have fewer children, they take better care of them, bring more of them up alive, and therefore have a net advantage in the long run. This complacent attitude needs much more proof. In a study <sup>3</sup> of families from which University of Wisconsin students come, it was found that the lowest rate of infant mortality was in those families where the parents had an elementary school education only. Those who had attended high school were less successful parents, the college graduates still worse, while the highest rate of infant mortality was reported in families where one parent was a Ph.D. These lost twice as many of their children as did the fathers and mothers with eighth grade schooling.

Not only are the college graduates not perpetuating themselves, but the strata of society which send sons and daughters to college are not perpetuating themselves. A study <sup>72</sup> of such families at the University of California showed that fertile

Protestant families had 2.47 children per family, fertile Catholic families 2.89, families of native-born parents 2.38 and families of foreign-born parents 3.14. This does not allow for sterile marriages in the group, nor for the proportion of adults who do not marry. Families which send a child to the state home for the feebleminded in California were found to average at least half again as large as those that send a child to the state university.<sup>123</sup>

6. Occupation shows a striking association with birth-rate. Various hierarchies of occupations have been arranged, according to the presumed social repute, the presumed or known amount of intelligence required for success in them, the economic rewards, the amount of education prerequisite, and the like. In general, white collar occupations are put highest, skilled labor next, and unskilled labor at the bottom.<sup>108</sup> The birth-rate is almost universally found to vary in the same order. Miners and agricultural laborers have the largest families, while the smallest are among the professions.<sup>109</sup> On the whole, the increase of the population is found to come mainly from the heavy laboring classes, manufacturing, agriculture, and mining, while the professional, clerical, trade, domestic and personal service, public service, transportation, and like occupational classes are not reproducing themselves.<sup>148</sup> Similar conditions have been found in almost every civilized country,<sup>6</sup> except in a few very recent cases.

This broad general trend would be undesirable euthenically, in so far as the more intelligent and prosperous families could presumably give their children better advantages. Its eugenic significance depends mainly on the relation between intelligence and occupation. The correlation between these two has been shown in various studies to be between .30 and .40. The classes with lowest scores for general intelligence (as shown, for instance, in the army draft tests) are those with the highest birth-rates. The causes of the differential birth-rate are numerous, but an important one has been shown to be the differential age at marriage.

7. Economic status, more directly measured, likewise shows a correlation with the birth-rate, represented at its extreme by the observation that the average millionaire <sup>138</sup> has twice as many children as does the average college professor. The difference between occupational groups is not merely a result of their differences in earning capacity, however, for within a given occupational group people of different income groups have almost the same birth-rate <sup>104</sup> The difference in size of family, then, is not merely a matter of budget, but more a matter of standards of living.

Economic status is certainly correlated to some extent with general intelligence, physical fitness, emotional stability, and the like. The advantage of children from well-to-do homes is seen even in the nursery school. In a group of 300 school children, nearly all of Anglo-Saxon stock, the correlation <sup>48</sup> between intelligence of child and economic status of father was found to be .50. The marked negative correlation, therefore, between economic status and birth-rate is dysgenic, particularly when, as in a study at Hagerstown, Md., the annual "effective fertility" rate per 1,000 women of childbearing age was found to be 161 for women of poor or very poor status, and only 84 for women of moderate or better status.<sup>149</sup> The large families often found among paupers and chronic recipients of public charity are a particularly undesirable factor.

The relation between economic status and eugenic value has been a fertile source of controversy and has led to emotional resistance in many instances. No one pretends that the correlation is anything like complete, but this is no reason for denying the existence of some correlation. The point is so frequently debated that it deserves analysis here.<sup>82</sup>

It is obvious that the possession of capital will correlate less well with desirable eugenic qualities than does income. Income that is paid for service and the reward of enterprise will correlate more highly than interest, rent, and dividends paid to inactive stockholders. Revenues of this second class derive what eugenic significance they have from the fact that they are built

on incomes of the first type, at some earlier period. On the other hand, the correlation of economic status with eugenic worth is lower where property is inherited or where wealth is the result of "unearned increment," or where investment is highly hazardous and speculative and it is the accidentally lucky one who comes under consideration.

Remuneration for services is much more important for this inquiry because it constitutes the largest part of the income of the largest part of the population, if children, invalids, the senile, and other non-productive persons are excluded, including home-makers whose production is actually great but not easily measured on a pecuniary scale

The competitive economic world is, in several ways, selective of superior ability. It will not do, of course, to push these suggestions too far, nor is it claimed that the same factors operate universally or with equal intensity or justice to all concerned. But they are certainly present in some degree and may even be called the general rule in the industrial and business world today.

(a) The search for employees is usually selective, either through competitive examinations, through the evaluation of experienced executives, or through weighing of diplomas, degrees, honors, previous positions, and previous salaries.

(b) Promotion is selective. Whether it be for the purpose of holding valuable men, or to promote the morale of the organization, or to stimulate employees to greater or more consistent production, or simply as a fair reward of merit, promotion recognizes superior ability. Influence and "pull" of course enter in. Even these may be associated with superiority of some sort—family connections, aggressiveness, possession of tact or other desirable social qualities. The defeated are naturally wont to attribute the success of the winner to favoritism, but not always justly.

(c) Regularity of employment is another element which attaches in some measure to superior germinal qualities. The superior workman is not ordinarily the first to be dropped in a

period of depression or reorganization. Neither is he subject to other types of interference that grow out of his own deficiencies. He is less liable to protracted illness because of better constitution and intelligent observance of hygiene. He is less frequently in trouble with the law through arrest and imprisonment. He is not handicapped by habits of inebriety or drug addiction, nor is he constitutionally psychopathic.

(d) The process of choosing one's profession or occupation involves a considerable degree of judgment of one's fitness—and this is no mean type of ability.

(e) Superiority is manifested to some extent by the avoidance of unwise investments and the choice of wise ones. To resist the high-pressure salesmanship of promoters of dubious securities is an evidence of stability, strength of character, and well-informed judgment.

For such reasons there will be, with many individual exceptions, a general tendency for the self-supporting to be abler than the paupers and dependents; for the prosperous to be of greater eugenic worth than the ne'er-do-wells.

8. Religious differences are notably associated with the birth-rate. In general, among somewhat comparable groups, it is found that Roman Catholics have the highest birth-rate, while Protestants are intermediate. Jews are in many instances the lowest, though the differences are great between orthodox Jews, Reformed Jews, and non-Judaists. These religious differences are so intricately associated with differences of other kinds that their interpretation is not easy.

9. Geographical differences are among the prominent features of the differential birth-rate. The southern states have a higher birth-rate, in general, than do the northern or western states. The rural birth-rate is everywhere higher than the urban. Differences between country and city rates are greater in the west than in the east. But the differences are only relative, a decline occurring in both rural and urban groups and in all parts of the United States. Exceptions to this trend, in limited areas, are due to temporary factors such as the presence of

an unusual proportion of immigrant women or their daughters.<sup>101</sup> Large families have become increasingly scarcer everywhere during the last generation, their place being taken by childless and one-child families in the cities, by two and three-child families in the country.

10. Racial differences are striking, but probably explained more by differences in economic and cultural level than by any inherent racial peculiarities. They are discussed further in Chapter XVI.

The existence of these various and large differences in the birth-rate is conspicuous. The exact nature of the differences is complex and hard to follow. The reason for the existence of the differences presents a still more intricate problem. Many possible reasons have already been pointed out, and others will be mentioned in almost every chapter of this book. In general, it has been held that the reasons are multiple and extremely numerous.

A striking attempt to explain the differences largely by one simple formula has been made by R. A. Fisher,<sup>88</sup> who holds that inherited differences in fertility are the primary factor. He starts with an observation of Galton's long ago, that the probability of an heiress—the only child of wealthy parents—being sterile is approximately four times that of the average woman. Heiresses have been in demand in England for the maintenance of expensive titles, and members of the higher aristocracy have married them frequently, in order to acquire in an honorable way the financial resources necessary to keep up their social position. Galton argued that if a wealthy family had only one child, it was likely to be a family marked by biological infertility, that this daughter would inherit such a lowered fertility, and that these marriages with heiresses would therefore prove sterile in an abnormally large proportion of cases, leading to the dying out of peerages. Investigation appears to show that his assumption was well founded.<sup>142</sup>

Considering the advantage of an heiress in making a desirable marriage not open to other girls of equal personal qualifi-

cations but from large families without wealth, Dr. Fisher was led to extend this idea to the whole question of social capilarity, or ascent in the social scale. Just as there is a tendency for ability to rise socially, so is there a tendency for infertility to rise socially because, in his opinion, the two go together. Other things being equal, the man with the fewest children is the one who gets along best in the world; he has more money to distribute to his children, they therefore marry better, and infertility is thus further intensified and spread in that part of the population which is able to provide leadership, so that after a few centuries of civilization, the abler strains of a people have been sterilized and, the dull but fecund remainder of the population being incapable of maintaining the civilization, it falls.<sup>157</sup>

This theory might seem at first glance to be contradicted by the fact mentioned elsewhere, that within a given class such as a royal family, an aristocracy, or a Yale or Harvard graduating class, the ablest members have the largest families and the least competent individuals have the fewest children or none.<sup>170</sup> Dr. Fisher ingeniously meets this by asserting that it takes much more intelligence and ability to rise to the top with a large family than with a small one, hence these men at the top are men of outstanding ability who, with smaller families, might have gone even farther in life. The practical application he makes is that society must stop putting a premium on small families, and begin to equalize the burden so that the large family may have the same standard of living as the small one, in a given occupation.

Dr. Fisher makes no attempt to define the exact genetic nature of this inherited infertility, though he assumes that it may be both physical and psychical. While some striking pedigrees have been published that seem to show the inheritance of partial sterility, it does not appear from the few studies available<sup>75</sup> that such inheritance is measured by a correlation of more than about .10. While this is quite large enough, as has been pointed out before, to produce a marked change in the population in a few centuries, it seems quite inadequate to account for the



rapid changes in the differential birth-rate that take place within a single generation.

The increase in childless families, particularly in the educated part of the population, during the last few generations has been large, and a considerable part of these are certainly involuntary, although there are some in which the couple have deliberately desired no children. Analysis <sup>107</sup> of the childless marriages in one group of 1,000 educated married women revealed (from their own confidential statements) that the childlessness was involuntary in at least a majority of the cases. Recent study has shown that in most sterile matings there are a number of causes divided between the two partners, and that on the whole these seem to be due to avoidable evils of city life, more than to any mysterious inherited factors. Since the amount of sterility does seem to rise with education and civilization, until nearly 20% of the marriages of college graduates are childless in some areas, measures to combat sterility are an important part of a eugenic program. Dr. Fisher's plausible presentation has called attention effectively to this problem, and has been of still greater value in emphasizing the need for removing the excess burdens of the family, as a matter both of social justice and eugenics. But it still seems probable that the declining birth-rate is a problem more sociological than genetic.

In this chapter and the preceding one, natural selection has been seen at work in civilized communities. The details of the picture are complicated and confusing, but the general outline is fairly clear. Evolution is proceeding at a rapid rate through natural selection, and at a very much more rapid rate through reproductive selection. The acceleration is such as is scarcely known in a normal species other than man. The progress of evolution is in some respects perhaps a hundred times as fast under present-day civilization, as for a typical species living in a state of nature.

In various countries it has been found approximately true that one-fourth of the present generation produces one-half of the next generation, two-fourths perpetuate themselves, and

the other fourth produces nothing. Whatever germinal differences exist between the first fourth and the last fourth are therefore being spread with startling speed. It is a matter of the highest importance to determine the direction in which these changes are taking mankind.

1. Physically, the resistance of the race to various diseases is being increased, and it is becoming more able to stand the crowding of city life. At the same time it is probably becoming less resistant to degenerative diseases. From now on, children will have a longer expectation of life than formerly, middle-aged people will have a shorter expectation of life than formerly.

2. Intellectually, it can hardly be doubted that a persistent deterioration is taking place.

3. Emotionally there are conflicting tendencies. While unstable nervous systems are continually being eliminated from the race by war, crime, alcohol, venereal diseases, and a score of other agencies, there is still a multiplication of them through the reproduction of the mentally diseased.

On the most optimistic basis, the general balance is not as good as it ought to be. Continued selection is necessary to prevent racial deterioration. Civilization has either set this selection aside or reversed its direction, as respects some important characteristics, intelligence above all. Only a broad and soundly planned eugenic policy will maintain the equilibrium, by the most humane and least costly methods.

## CHAPTER VII

### THE NEED FOR NEGATIVE EUGENICS

Universal education to develop the best traits of each individual (up to the level of diminishing returns), and social justice so that he may have a chance to use these traits to the best advantage, are essential to the organization of society on a sound eugenic basis.

But with every facility of this sort, there will still be many members of society who are liabilities rather than assets. Foremost in numbers are those who are mentally diseased.

In any one year the hospitals for mental diseases in the United States have about 300,000 patients. But the turnover is rapid: some are sent home in a short time, some die in a short time. Calculations<sup>112</sup> show that the number of persons who either are now, or at some time in the past have been, or at some time in the future will be, committed to state hospitals as "insane" is about 5% of the total population. But many other persons, no less seriously affected, do not get into the state hospitals. They are either cared for by relatives, or neglected altogether. Calculations<sup>105</sup> based on the examination of the draft during the World War indicate that at any one time there are just as many persons outside the hospitals as inside, with some mental disease serious enough to incapacitate them for their regular work.

The part of the population liable to mental disease therefore amounts to about 10% of the total. The number of hospital beds occupied by them is as great as the number occupied by all other patients put together—the victims of accident, those suffering from physical diseases, the women in childbirth, and every one else who goes to a hospital for any reason. The economic loss due to hospital cases of mental disease alone

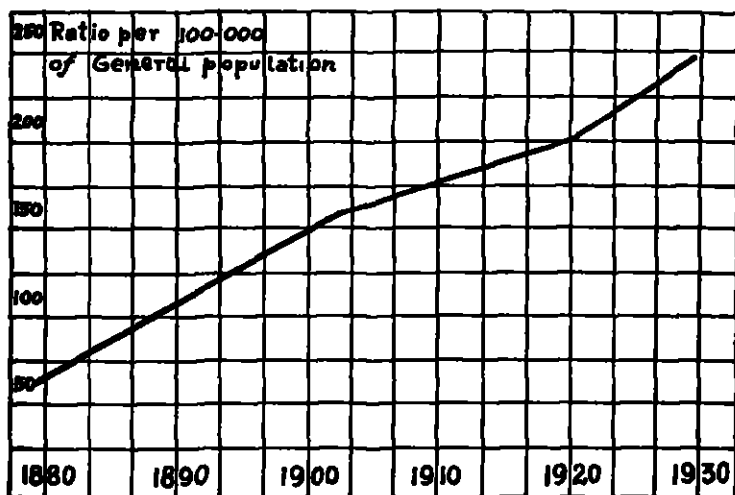
has been calculated at three-quarters of a billion dollars a year.

One mental disease alone fills more hospital beds than any other disease, mental or physical. This is dementia praecox, which has been estimated to involve a loss to the United States of a million dollars a day.

Dementia praecox usually can be foreseen in the adolescent period if not during childhood by a trained observer. The boy or girl who has inherited this particular type of constitution is mentally shut in and finds it more and more difficult to meet the rough and tumble of daily life. He tends therefore to avoid such difficulties by keeping to himself and finding satisfaction in daydreams instead of in active participation in the world's affairs. Finally he comes to a mental state which resembles that of a man who is awake and yet living in a dream world. He is quite cut off from what is going on around him, except as he gets an idea that he is subjected to persecution or influenced by some mysterious power directed by an enemy. He may start up out of his dream long enough to commit a crime of violence, but is usually committed to an institution where he deteriorates steadily. The prospect of a cure is slight. In a large proportion of cases the patient eventually dies of tuberculosis, the constitution which predisposes him toward the mental disease seeming also to favor the physical one.

The other great type of mental disease is usually designated as the manic depressive, and is the opposite of the one just described in some ways. Instead of being introverted in childhood, the patient has probably been extraverted, has been too susceptible to influences around him, and too likely to take color from his environment. There is an unstable tendency in this disease, marked by great exaggerations of the normal swings of mood which every one experiences. For a while the patient is in an excited or manic phase during which he may commit a crime of violence. Then this passes and, after a neutral or more or less normal period which may be prolonged, he goes into a depressed phase in which suicide is common.

Neither of these two main types of mental disease represents a simple genetic difference, but they do seem to be associated with certain types of inherited physical and mental constitutions which run in families. As more than one gene difference is involved in each case, not all the offspring of an af-



THE INCREASE OF INSANITY

FIG 27 —This graph from the Human Betterment Foundation, Pasadena, shows that the amount of known insanity has increased much more rapidly than has the population as a whole. This increase is partly due to better diagnosis and reporting, partly to immigration of unstable persons, partly to the increasing strain of life and the movement of persons from the farms to the greater complexity of city surroundings, partly to the increased expectation of life. But back of such causes is the perpetuation of defective genes, through the reproduction of their carriers.

affected person will show the same affection, but the various traits are passed along to reappear in suitable combinations in descendants.

Some of the genes particularly involved in dementia praecox seem to be recessive, and only about 10% of the children of a person with dementia praecox are affected with the same disease. Others have presumably some of the genes in question

and these with the family environment predispose to emotional and mental peculiarities; so that while only one-tenth of the offspring will die of dementia praecox, one-half will be abnormal in one way or another.

The manic-depressive psychoses seem to include more dominant elements, so that skipped generations are less frequent. Here again some of the offspring of an affected person are normal, some manic-depressive, and some not actually affected with the disease, but abnormal in other ways. In some studies of the children of a manic-depressive parent mated to a normal individual, only about one-third turned out to be normal.

Mental disease represents the outcome of a balance between the inherited constitution and the stress to which it is subjected. Some people inherit such sound and resistant constitutions that they can withstand almost any imaginable mental strain without breaking. Others inherit such susceptible ones that the simplest strain may cause them to go to pieces. In some instances the individual who is handicapped by an inheritance can protect himself by particularly intelligent handling of his problems, and get along successfully in the world. Mental hygiene is therefore of the greatest importance, but even when successful does not change the inborn constitution that will be duplicated in some of the descendants.

Epilepsy is one of the commoner mental and nervous disturbances, the number of persons affected by it in the population being several hundred thousand.<sup>113</sup> *The ancestry of epileptic patients usually shows a few cases of epilepsy and many other evidences of weak nervous systems such as alcoholism. Cases in which the epileptic actually comes of epileptic parents are the exception. If, however, the posterity of an epileptic patient is traced it is found to show more instances of nervous upset including epilepsy. While the inherited constitution in this disease is apparently not as important as it is in dementia praecox or manic-depressive psychoses, it should nevertheless be taken into consideration. Altogether apart from inheritance,*

a patient with epilepsy is usually not a suitable father or mother for normal children.

Another important type of mental disease is paresis, due to syphilitic infection of the brain. Obviously the disease will be wiped out when syphilis has been eradicated. In the meantime recent new treatments are curing or arresting many cases heretofore doomed to die in a few years.

*Many of the milder types of mental disturbances which do not lead to commitment as insane probably represent constitutions built upon some but not all of the genes that would produce an actual breakdown. In these mildly impaired constitutions, better mental hygiene will frequently enable the individual to lead a normal life. Even when unfavorable experiences have led to serious complexities it is sometimes possible to eliminate them and to restore the patient to health by the resources of the psychiatrist.*

Mental disease seems to be commoner in the uneducated parts of the population and in the lower social and economic strata than in the higher.<sup>111</sup> This is partly because the later age of marriage in the educated strata gives more time for the affected to break down before marriage, and therefore to be eliminated rather than to pass on the defect. Beyond this probably the wider range of interests and greater intelligence of these classes make for a better adjustment to their problems.

Mental disease is so widely prevalent that it can not possibly be eliminated in the near future. With increasing civilization, conditions become more difficult for many people to face, and the need of better constitutions to withstand them, as well as of better education, is manifest. If an individual has real gifts to transmit to posterity these may well outweigh some weakness of constitution. But where the individual has little to transmit except a liability to mental disease, parenthood may well be restrained or reduced.

As contrasted with mental disease, mental deficiency is present from birth. The adult who is mentally deficient has never been normal. The adult who is mentally diseased probably

represents a breakdown from a higher level of efficiency which he once reached.

Mental deficiency of the lower grades is not as widely prevalent as mental disease, but it is nevertheless one of the most serious problems of every civilized country. Its amount depends upon the level used in the definition that one accepts. The conventional definition following one adopted in Great Britain years ago is that *feeble-mindedness* represents an inability existing from birth or an early age to get along in the world successfully and to meet the types of problems that are encountered in one's natural environment. This is a social definition and a useful one in many ways, but has the disadvantage for other purposes of being merely relative. A man may be normal on his little farm in a mountain valley because he can successfully meet the problems that are met by his neighbors. Moved to a large city he can not do so, and by definition becomes feeble-minded. This feeble-minded individual can then be "cured" by moving him back to the hills where *he has a different type of problem to meet.*

In practical life this may be the best solution of his individual case, but such a definition of feeble-mindedness is inadequate for research. Many students have therefore utilized a purely arbitrary standard based on the amount of mental ability as revealed in mental tests. There is a common tendency to classify as feeble-minded anyone who has less than 70 I.Q., that is, less than 70% of the average intelligence for his age. This is a much more useful definition in research because it gives a quantity that can be compared conveniently with others. It is arbitrary, however, because many persons below 70 I.Q. are not feeble-minded in the social sense of the term. They are getting along pretty well in their own environment and keeping out of trouble better than some other persons with an I.Q. twice as high. While each of these definitions is useful in its own way, the worst confusion has resulted from a nearly universal tendency on the part of writers to use the two interchangeably.



The White House Conference of 1930 defined the problem as follows:

"For want of a better word, the terms 'mentally deficient' and 'mental deficiency' are used throughout this report in a generic sense to denote that 15% (approximately) of the total population of the United States whose level of intelligence does not or in all probability will not exceed a mental age of 12 years. Using this criterion, it is estimated that approximately 13% of the total population are intellectually subnormal or retarded but may nevertheless be socially adequate; similar estimates assign about 2% to the definitely feeble-minded class lacking the ability to manage and support themselves or to become socially self-directing."

The adoption of a mental age of 12 years as a dividing line is equivalent to 75 I.Q. as the calculations are usually made with 16 years as a base, the development of inherent intelligence being largely completed by that time.\* If the more conservative position is adopted, using 70 I.Q. as a dividing line, it appears that about 5% of the total population will fall below that line <sup>12</sup> and, by this purely arbitrary and technical definition, might be called mentally deficient. They are at least handicapped in falling short of average intelligence by 30% or more, since the average itself is not representative of a very high degree of mental ability. Finally, those who depend wholly on a social definition of feeble-mindedness vary in their estimates, but usually agree <sup>22</sup> that not less than one million of the population is so incapable as to be called feeble-minded. The 2% put in this category by the White House Conference would represent two and one-half million people.

Whether one takes only the lowest estimate, calling one million people socially feeble-minded, or goes with the White House Conference to point out 15% of the whole population (not far from 20,000,000 people) as "mentally deficient," it is evident that the figures are large. At best, the presence of

\* It is now generally recognized that 16 years is too high, and that the base should be taken a year or two below this, if it is to be in line with the facts.

this great body of persons of low intelligence and sometimes badly adjusted is a serious community problem. They clog up the lower grades of the schools, contribute more than their share to juvenile courts and corrective institutions, and far exceed their quota among the dependents and the recipients of public charity. The damage they do to proper standards of efficiency in work, in government, and in ethics is probably much greater, though incalculable.

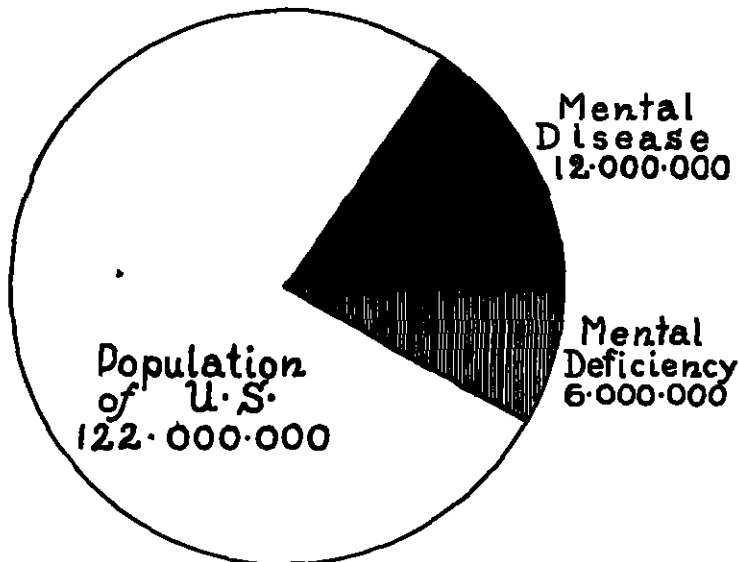
The first step should be to get these persons of lower intelligence adjusted as well as possible in the community by seeing that they get the type of work they can do best and are not put in positions where they will menace the rest of the population unnecessarily.

Beyond this many are found to be so unstable emotionally or to have been subjected to such unfavorable influence that they cannot get along successfully in the community without help. The extreme cases have to be put into custodial institutions. It would be quite impossible to provide custodial care for all the mental defectives, as it would demand an intolerable sacrifice by the remainder of the population. Only about 60,000 are actually in state institutions in any one year, and many of the states have very inadequate provision for this type of dependent. There is a general tendency to make such care unduly expensive, the average probably being not less than \$500 per year per patient if the overhead is included. Many of the mental defectives would be happier, healthier, and more productive if in the initial observation period they were put in labor colonies where they could do work in accordance with their abilities and could be in many cases self-supporting.

Many others can get along in the community, perhaps after some special training in institutions, provided they have supervision and provided they are not handicapped by the production of children for whom they are unable to care. A system of state supervision involving parole with sterilization is effective in such cases.

There has been much controversy over the origin of mental

defect and much attempt on the part of partisan writers to avoid the plain evidence of family histories that it is to a very large degree an inherited condition. Congenital syphilis, formerly blamed, has been excluded since it was found that there is no more of it among mental defectives than in a normal



THE MENTALLY HANDICAPPED PART OF THE POPULATION

FIG. 28.—About 10% of the entire adult population will at some time during life break down from mental disease, to an extent sufficient to incapacitate them for their ordinary work. Another 5% is handicapped by mental deficiency to the extent that it has less than 70% as much intellectual capacity as the average. These two groups, which impose such a heavy burden on society, are built up largely on the basis of defective heredity. Graph from the Human Betterment Foundation, Pasadena.

population, and that the feeble-minded with congenital syphilis have slightly more intelligence than the rest of the feeble-minded.<sup>28</sup> Sometimes failure of the nervous system to develop properly is due to disease, birth injury,<sup>30</sup> or to accident in childhood, but such cases probably amount to less than one-third or one-fourth of the total, and the remainder seem to repre-

sent unfavorable combinations of genes. They are often defective in body as well as defective in mind, the two conditions both being manifestations of the inherited constitutions. The greater the mental deficiency, the greater in general is the associated physical deficiency, and interestingly enough this association is closer in boys than it is in girls, possibly because of the effects of the sex chromosome.<sup>26</sup>

Since differences in many different genes may disturb development in such a way as to produce mental defect, it could not well be the same thing genetically in all individuals, and it would be expected when some defective man marries some defective woman that defective genes in one can be counteracted by normal genes at the same location in the other, so that their offspring would be relatively normal. This is found actually to occur, but in such cases the more or less normal offspring will of course pass on the defective genes to their own posterity.<sup>124</sup>

In a general way, moreover, the different levels of intelligence tend to be inherited.<sup>120</sup> While a child with an I.Q. of 125 is occasionally produced by parents with I.Q.'s of 75, he is produced with vastly greater frequency by parents of 125 I.Q., and still more frequently by parents of 150 I.Q. The superior parent, on the other hand, will occasionally have a defective child simply because of accidentally unfavorable combination of genes at the reduction division.

Strictly speaking there is no cure for mental deficiency. It represents an inherited handicap on development, too great for education to overcome. The best that can be done is to find work that fits the capacities of the mental defectives and to prevent them from being exploited by unscrupulous persons of greater intelligence.

It is scarcely necessary to say that while genius is occasionally associated with mental disease, it is not associated with mental deficiency. No genius was ever the offspring of feeble-minded parents. A reduction in the birth-rate of these will not cut off the world's supply of talent. It will, it is true, elim-

inate some normal children, but the world is not now so much in need of normal children that it must force them to be reared by feeble-minded fathers and mothers.

The criminal class has not yet been sufficiently studied to provide the eugenicist with the information he needs. In any one year there are more than 100,000 persons in the prisons of the United States. It is impossible to say how far these are imprisoned because of inherited qualities and how far simply because of social and educational conditions. Crime being a social concept, it is impossible to talk about the inheritance of criminality as such.<sup>121</sup> Doubtless some persons with unstable nervous systems and lack of inhibitions are more likely to commit crime than are others. In general, improvement in the eugenic qualities of the race will therefore probably reduce the number of potential criminals, and make easier the task of those who through environment and training are charged with preventing persons from committing criminal acts.

Many of the physical defectives in the population are a liability to themselves, their families, society, and posterity. The number of blind is about 75,000, the number of deaf nearly 100,000. While most of these owe their condition to infectious disease or to accident, perhaps 10% to 20% are the victims of defective heredity which they will pass on to offspring if they have any.

Another group that represents a burden to society and to themselves is made up of the chronic paupers. While many dependents on public charity are the victims of accident, disease, or misfortune, there is also a class in which chronic dependency results from physiological inadequacies sometimes made more serious by a dull mind, and in which the members never have contributed and apparently are unable to contribute anything worth while to society for their board and keep.

Calculations of the cost entailed on society by the presence of the unfit are so large that one scarcely dares to cite them. James H. S. Bossard,<sup>10</sup> after describing the various classes,—the physically non-effective, the mentally deficient, the mor-

ally deficient, the socially deficient, and the mentally and nervously ill,—cites figures to show that the direct costs to the United States for identification, disposition, maintenance, and treatment of such persons are five billions of dollars a year.

The indirect costs are far larger. They include the loss of possible contributions of such persons, material and otherwise, and their deleterious effect upon other persons. He concludes that the available data warrant an estimate of four or five dollars indirect costs for every dollar of direct costs. This would place the indirect costs at between 20 and 25 billion dollars a year.

The handicapped part of the population then runs into the millions, and in some cases the handicaps are not only hereditary but of such a nature as to make it appear unlikely that society will benefit by having them perpetuated. While the individual deserves the most sympathetic help as long as he lives, it is gradually coming to be recognized that this sympathetic help need not necessarily include aid to leave a large number of offspring to receive the same sort of sympathetic help in the next generation.

To some extent natural selection is already controlling the reproduction of the defective, but with modern charity this action tends to be more and more inactive, so that in some cases the defectives are actually subsidized to have larger families than the normal parts of the community.

The mentally diseased in institutions have a low birth-rate,<sup>123</sup> partly because of the severity of their diseases, and partly because family life is broken up by commitment to hospitals. In most such cases that have been studied the families are not large enough to perpetuate themselves. However any children at all in such a family may be too many.

The mentally diseased persons who do not get into state institutions and who have not been legally labeled insane seem to have families quite as large as the average, if not larger.<sup>124</sup> These therefore represent a real problem eugenically. Education should be directed toward making them realize the unde-

irability of parenthood unless they are able to take care of their children properly and likely to be able to pass on to them inherited endowments that will make them really valuable members of society. At the same time, facilities for preventing reproduction through sterilization or contraception should be made freely available to them.

*Discussions of negative eugenics that have in some cases gone so far as to assert its impossibility too often overlook the fact that there are already numerous social measures limiting sharply the reproduction of various parts of the population. It is not a question of introducing any new principle, but of endeavoring to make the existing measures and agencies more discriminatory. Listed without regard to order of importance, some of these methods of restriction are:*

1. Voluntary restriction of conception, which has been used by almost every people in every age since the beginning of history. (Abortion and infanticide may perhaps be regarded as abnormal and dangerous substitutes for contraception.)
2. Increased age of marriage, which delays the beginning of childbearing.
3. Surgical sterilization.
4. Laws requiring notice of intention to wed, which have been found to prevent many unwise marriages, and therefore prevent the birth of many inferior children.
5. Physical examination before marriage, which has the same result.
6. Divorce.
7. Celibacy.
8. Segregation of certain persons, whether feebleminded, criminal, or otherwise.
9. Capital punishment, which in some societies sometimes has had an important eugenic effect, and sometimes the opposite.

While the mentally diseased below a given level often recognize the desirability of limiting their own offspring, the men-

tally defective more often do not, or if they do, have so far been unable to control the situation. By definition a person who is lacking in intelligence, foresight, and self-control, is poor, is perhaps alcoholic, and is able to get more money from the county charities for every new baby, is less likely to be successful in preventing childbearing. Every facility should be available to undesirable parents for the prevention of conception, but when they are unwilling to control their own fecundity the state will in some cases have to intervene by selective sterilization.

While the birth-rate of the unsterilized mentally defective out of institutions has often been exaggerated, it is in all studies that have been made large enough to perpetuate the group and often much more. Since the economically fit, useful, and self-supporting part of the population is not reproducing its own numbers, in the countries of higher culture, such mental defectives in almost every community are outbreeding the mentally superior. The genetic decadence thus produced may be compensated for a while by euthenic means but not for long.

In modern industrial conditions the low grade worker is less useful than ever before. A moron who is able to do no more than push a single lever on a single machine all his life may be an asset to some kinds of industry, but he is not an asset to society as a whole. He debases the electorate, public opinion, and consumptive demand. With the rapid technological changes that have been taking place in the last generation, and that are certain to continue, such a man becomes of little value in some fields of industry. Not merely his machine but the entire industrial plant of which it is a part may be abolished tomorrow by industrial changes. Unless he can adapt himself to an immediate and sometimes radical change of occupation, he simply falls into the class of the unemployed to be supported by others. It is probable that many of the people thrown out of employment in 1929 will never hold a real job again as long as they live. The man of greatest use to society, even in the lower grades of industry from now on, is the man with intelligence



and adaptability enough to turn rapidly from one type of work to another as science and industry progress. Others are dubious risks.

This fact has sometimes been used as an objection to any type of eugenic program. How, it is asked, can anyone see what sort of qualities will be needed by mankind in the future? Society might be breeding a type that is now useful, says the critic, and find centuries or a millenium hence that it was useless and that the types suppressed were precisely the ones then needed.

Such an objection exaggerates the specificity of abilities. No eugenicist proposes to breed for any narrowly specific type of man with little variation, and it would be difficult to do so even if it were desirable.

It is hard to imagine any state of society in which health, intelligence, and efficiency will not be more valuable than disability, ignorance, and ineptitude. The various qualities tend to go together. Eugenic reforms are directed toward raising the level of the race, and toward producing on the whole a wider distribution of health, intelligence, and efficiency, and a lesser amount of the present levels of disability, mental defect, and incapacities.

*If such a change is made there will be no less specialization than at present, but rather a greater specialization of traits of all kinds starting from a somewhat higher level than now.*

## CHAPTER VIII

### SELECTIVE SEGREGATION

Persons who are effectively segregated from the rest of the population will during that time (provided the sexes are separated) be prevented from reproduction. Hence study of the groups that are segregated for one reason or another is important for the understanding of eugenic trends.

1. The largest segregated group in the United States is probably that of the *mentally diseased*. It has been pointed out previously that this group both during and after segregation will contribute less than its quota to the next generation. Its main reproductive period comes before the time of first commitment to an institution. In the case of dementia praecox patients the contribution is small because the disease has a typically early onset. In the case of manic depressives and in some other cases where the final breakdown may not come until middle age, the number of children previously produced may attain the average. The fact that only one in every four of the first admissions to American psychopathic hospitals is as early as 30 years of age shows a serious limitation of this sort of segregation from a eugenic point of view.

Of those patients released from the hospitals as recovered, three out of four are likely to return at some future time. This means that most of them, though sufficiently recovered to return temporarily to their own homes, are to some extent still disabled. Since some of these patients understand their condition, they will in many cases avoid the production of further children if able to do so. When this is improbable, sterilization should be used as an adjunct, as has been effectively demonstrated in many states, even those which do not have eugenic sterilization laws.

On the whole, the problem of the mentally diseased under segregation is less serious eugenically than that of the mentally diseased who do not enter the hospital, as has already been mentioned.

2. The criminal classes, amounting to about 100,000 in institutions in any one year, are prevented from reproduction so long as they remain in institutions. However the parole systems and a liberal interpretation of indeterminate sentences are rapidly returning criminals to the community. Thus, in the state of California, it turns out that a sentence to the state prison "for life" averages seven years of actual imprisonment.

Much more thorough study of the individual prisoner is needed. In many cases he is either mentally deficient or mentally diseased and should be dealt with as such. In some cases his parole should be made contingent on sterilization. The Pennsylvania practice of withholding the parole of the illiterate in most cases till literacy is attained is incidentally of eugenic value.

While many persons convicted of crime may undoubtedly have normal children, a habitual criminal makes a poor parent in general for normal children and it is not in the interests of society to let normal children be reared, trained, and inspired by habitual criminals. The euthenic argument for restriction of parenthood in this class has been given less attention than it deserves.

The whole subject has received so little study that it is not yet clear what percentage of the criminal population is married and what percentage has children. In some studies the reproduction of convicts in proportion to age has been found equal to or greater than that of the population as a whole. In other cases it has been claimed that a majority of the convicts are either unmarried men or men separated from their wives and having no offspring.

Since long-continued imprisonment enforces an abnormal sex life, a widespread movement during recent years has favored making some provision for this. In Russia certain classes

of prisoners are allowed a parole to go home to their wives twice a month. In some Latin-American countries the wives have been encouraged to visit their husbands at prison, and special quarters have been provided for them. If such a policy is to be adopted, it will be of the highest importance that the eugenic aspect be more carefully considered. In the case of many prisoners it would be desirable to allow such privileges, only after sterilization.

The whole question of the biological aspects of criminality needs much more research, but meanwhile the state should make an even greater effort to prevent the perpetuation of the *insane and feeble-minded, who are also criminal, than those without criminal record.*

*The need for the institution for criminal insane is met in only a few states. Even when it is met a faulty system of distribution leaves some insane in most of the penitentiaries or state prisons.*

The institution for defective delinquents is a recent type. This new classification helps the work of both the reformatory and of the institution for the feeble-minded by ridding them of inmates who make their work more difficult.

Those offenders who are deficient in intelligence should not be the only cases sent to the institution of defective delinquents. Others who should be sent are individuals showing marked aberration in decision, resolution, anger, or excessive apathy. In determining when the inmates may be liberated there are other factors that are more significant than the particular offense for which convicted and the length of term for which committed.

Eugenic considerations strongly support the penological policy of E. Ferri. In this, the nature of the criminal becomes the dominant consideration, rather than the nature of his offense. Courts should be limited to the problem of determining who committed the alleged offense. All questions of insanity, responsibility, and length of punishment are not really legal problems but scientific problems, and as such could best be handled by the technique of the scientist.

The first task is thoroughly to diagnose the subject. This involves his being kept in an observation ward for at least a few hours each day with a larger degree of freedom. After this and other investigations, the subject should be classified. Periodic examination and reports lead to occasional reclassification. Release, parole, or "pardon" are all problems not for governors or district attorneys, but for a parole board of experts free from all extraneous influence, intent on the welfare of society. When can this man be considered a sufficiently safe risk to be put out on parole? By this is meant a genuine parole under an expert with not too many men to oversee.

The idea that the man "not guilty because of insanity" is of less concern to the state than the guilty man is unsound. Since the risk of a new offense is greater in the former case, society should be more eager to put into segregation a "not guilty" insane offender, than a guilty sane offender. Whether or not the offender should be segregated depends mainly on the degree of risk involved to society in case he is released. For this reason the new tendency to put greater stress on the person's number of convictions as expressed in the Baumes law is good but there are other factors that should be considered as well as the number of convictions.

Criminals should be studied for evidence of dysgenic traits that are germinal in nature. Where found in a serious degree, parole should not be granted without sterilization.

3 Religious celibacy in its institutional aspects accounts for the withdrawal from reproduction of a large number of men and women, while a still greater number is vowed to celibacy but not segregated institutionally. The effect is the same in either case, and the total number of persons affected in the United States is not far from a hundred thousand.

On the whole these religious celibates are probably above rather than below the average of the population both in intelligence and general fitness. This is true at least for the males where a higher educational performance is in general required. Eugenically their failure to reproduce is dysgenic. On the

other hand, where institutional segregation is provided for emotionally weak or unstable types of persons who sometimes thus find a refuge from the problems of existence and a satisfied emotional outlet, celibacy would be desirable eugenically as well as in other respects.

4. Standing armies have always represented one type of segregation which has, as elsewhere noted, been harmful not only in preventing normal reproduction from this group but in hygienic effects by promoting the spread of venereal diseases which has indirect eugenic significance. Short terms of enlistment and facilities for maintenance of the families of enlisted men are the best remedies. The 100,000 or more men who make up the American military establishment are well above the average physically and probably not inferior to the average mentally. In this respect the quality of the army seems to have improved from decade to decade, with a correspondingly greater eugenic loss.

5. The sick and the crippled are segregated temporarily or in some cases permanently, and so long as segregation lasts they will not reproduce.

More than 200,000 hospital beds are occupied by the physically ill, but for the most part these are temporary occupations and consequently segregation will not materially interfere with their reproduction, although permanent disabling effects of illness may do so either directly or indirectly through diminished earning capacity or attractiveness as a mate.

The number of crippled has been estimated as high as 750,000. Most of these are victims of accidents. Some of them are not prevented from marriage or are not prevented from further reproduction, although in many cases their economic efficiency may have been lowered by the accident. Few of these are permanently segregated. In the case of some with inherited defects, sterilization would be indicated. On the whole, however, this group presents a euthenic rather than a eugenic problem.

6. The mental deficient, amounting to about 60,000 in any one year, are distributed very unequally among the different

states. Some of the wealthier and more progressive states take care of a considerable part of their mental defectives at heavy expense, while a few states still have no proper institutions for the purpose at all. Every state, however, has now made provision of some sort for them.

There has been a wide variety of opinion in the United States during the last generation in regard to the segregation of this class. For some years before the World War informed public opinion looked forward to segregating most if not all of them. As the magnitude of the problem began to be discovered, it was soon realized that no state could afford to provide for the segregation of the entire group, and further study showed that this was not necessary. Some could adjust themselves to social life successfully with little help, others could do so with supervision and sterilization. By far the largest number were getting along fairly well in the community anyhow and were not even recognized as mentally deficient until the accident of being included in some mental test brought them to light. This situation provoked a reaction among some of the investigators who lost sight of the underlying biological realities, and who contended that mental deficiency was merely a problem of proper vocational guidance. Even with the best guidance and adjustment, however, the germinal intellectual level is not changed. The problem of mental deficiency must be met from a eugenic aspect as well as from others.

At the present time it is generally realized that every state needs better institutional facilities for the mentally defective. It is further realized that there are certain types which need lifelong custodial care. These include first, the helpless, and second, the unstable or delinquent who can not be successfully adjusted to community life.

Beyond this, institutional facilities are needed for a much larger proportion of the mentally deficient population as a temporary place of training, of discipline, of sorting, and of guidance.

The boy or girl who is only a source of trouble and loss in

the community is often found, after a year or two in an institution with intelligent management, to be able to return to



A GROUP OF MONGOLIAN IMBECILES

FIG. 29.—This characteristic type of mental defect is supposed to make its possessor resemble the Mongolian race but, as is seen in the above photograph, the resemblance is largely imaginary. The same type of defect occurs in other races, including the Mongolian peoples themselves, and seems to be due to faulty development of the embryo more than to inherited interference with normal development. The Mongolian imbecile is most likely to be the child of a mother of advanced age. Photograph from Dr. Kate Brousseau, The Institute of Family Relations, Los Angeles, Calif.

the community under proper supervision and to make his or her own way fairly well. For many of the mentally deficient, institutions must therefore be looked upon as necessary train-



ing schools rather than merely places for lifelong maintenance.

Since the upkeep of institutions of the ordinary type is extremely expensive, a sort of half-way station has been provided by the creation of labor colonies. These have a much lower overhead, and offer a good place for trying out the persons who have been in an institution for a time before they are returned to independent community life.

A labor colony for mentally deficient boys and men is often a mobile unit which can be used for heavy work such as clearing land, draining swamps, or reforesting hills. While its economic efficiency must not be exaggerated, it should be nearly self-supporting, and a healthful camp life in the open air is enjoyed by its beneficiaries. Some of these will never graduate from it, but others if found to be reasonably dependable may be sent out later as farm laborers, or in some similar line of work, provided an employer who understands will take the responsibility for them.

Similar colonies for girls and women have more frequently been put in settled communities where the girls could either do domestic service in the neighborhood or work in canneries or other industrial establishments. Such a system has also been successful, although the problem of giving an adequate recreational life to girls is one that requires much thought.

The intention of such a scheme is often to enable girls to make a successful adjustment to community life. If this includes a normal participation in the recreational life of the community, it will in many cases normally lead either to marriage or to illegitimate pregnancy, and thereby create a eugenic problem.<sup>183</sup> Sterilization therefore seems to be a necessary part of such program, and with sterilization, labor colonies can make a real contribution to the problem of the mentally deficient.

The next step after the colony is to allow the individual to return to the community on trial under supervision from an official of the institution. If patients are paroled to responsible families, the parole officer may be able to keep track of fifty

or a hundred. Usually it is considered a mistake to let the patient go back to his own family. If the family had been able to care for him, he probably would not have been committed to the institution in the first place. Because of the inadequate institutional facilities and the long waiting list in most states, institutions get for the most part only two types of patients, namely, the helpless, and the delinquent who is a menace to the community while at liberty. It is a real achievement, therefore, when some of the last named can be returned successfully to an independent life.

The magnitude of the problem of mental deficiency is just beginning to be recognized, and so far it has by no means received the attention it deserves. One of the logical lines of development seems to be to work out some sort of supervision over the mentally deficient which will be reasonably effective, but much more economical than most of the systems now in existence. Another promising device is that of labor colonies in which married couples of mentally deficient people after sterilization will be able to find a more or less permanent home and to be self-supporting and self-respecting without being subjected to the strain of free competition in the community.

7. Poorhouses and county farms house fifty or sixty thousand dependent paupers, many of whom are indigent aged persons who are no longer likely to have offspring. In other cases, however, there are recognized "poorhouse families" that have been dependents on the charity of the county for two or three generations. These form a somewhat distinct part of the population, characterized usually by many anti-social traits and by low intelligence.

The number of temporary applicants for charity is enormous, but of course varies largely from year to year and does not get institutional segregation.

Far from being either a crime or disgrace, poverty is sometimes an incentive to greater achievement, and the administration of the poor laws should be studied more carefully with

a view to giving appropriate opportunities to those likely to profit by them and avoiding the tendency to treat all alike. Some who, through sickness, accident, or both, have to apply for county aid are promising material worthy of much more help than they get. Others are mentally defective delinquents who should be dealt with in an entirely different way.



**FEEBLEMINDED MEN ARE CAPABLE OF MUCH ROUGH LABOR**

FIG 30—Part of the cost of segregating mentally defective persons can be met by organizing their labor so as to make them more nearly self-supporting. In many states labor of this type could be used for such work as reforestation, drainage of swamps, and clearing land. In this way they might be protected from excessive competition and at the same time kept under control, if they were not sufficiently stable and intelligent to be returned to the community under supervision, after training and sterilisation. Photograph from The Training School, Vineland, N. J.

When a family is in receipt of charity for more than a year, *it should be encouraged to avoid further reproduction until it is able to stand on its own feet.* Wide use of contraceptive clinics would be desirable here. In the case of the chronic pauper families that are subsidized from generation to generation, sterilization is usually the best remedy.

Charitable agencies have often been careless about their

responsibility, and have allowed dependents to go on propagating at the public expense, the main difference being that when in receipt of charity their children were more likely to grow up *than would have been the case if the parents had not had this extra help*. A study of 500 families which had been in receipt of aid from the public charities in a California county for a period of at least five years (often intermittently, of course), showed the average number of children was 4.33. Those who had been on the lists of the county for only five years had an average family of 3.85, those who were known to the county for more than ten years averaged 4.96 children. Taking mothers who were under 40 at the time the investigation was made, so that they were still of childbearing age, it was found that they had had an average of 2.72 children each before they first went on the books of the county's relief department, and an average of 1.58 children each, since they first became recipients of relief. Since their natural fertility was declining with increasing age, it appears that being the recipients of charity led them to continue childbearing at a normal rate. Nearly one-fourth of these families had been receiving public funds, on and off, for ten years or more.

8. Orphanages have gone out of fashion, but 50,000 or more children annually are still housed in institutions of this general type. *Few of them, however, are full orphans. Most of them have at least one parent living, and about half of them have both parents living. They have been abandoned by their parents, or in many cases taken away by the court because these parents were believed unfit to care for their own children.*

It goes without saying that such parentage contains many deficient or ineffectives, and it is not surprising to find that inmates of these institutions are characterized by a high degree of prevalence of mental deficiency, of congenital syphilis, and of delinquency. The opportunity is provided the state to study the child and his ancestry and to look forward more into the future than it now does. Some of these children are of such low

grade that they require lifelong custodial care. Provision should be made in suitable cases to sterilize others at adolescence. Children who are normal should be placed in normal families where they can have as favorable a background as possible

## CHAPTER IX

### SELECTIVE STERILIZATION

Eugenic sterilization may be said to have passed the experimental stage in the United States. Its practice covers a whole generation, from the day in 1899 when Dr. Harry Sharp performed the first official (though not legally authorized) operation in the Indiana state reformatory. The number of operations performed officially in America up to 1933 is about 16,000.

A majority of the states have placed on their statute books laws for the sterilization of some of their public charges,<sup>61</sup> but the most consistent use of the measure has been in California, where since 1909 the state hospitals for the insane and feeble-minded have sterilized 8,500 persons (up to January 1, 1933). The workings of this law have been made the subject of prolonged and intensive study by the Human Betterment Foundation of Pasadena, under the direct supervision of its president, E. S. Gosney.<sup>67</sup>

Modern eugenic sterilization was made possible by the development, late in the nineteenth century, of operations for each sex which prevent parenthood, by shutting off the normal passage of the germ-cells, without removing any organ, altering any blood or nerve supply, or resulting in any change of feelings or appearance or in "change of life" in either sex. In this respect the operations differ wholly from the crude and mutilating castrations that were performed in earlier ages. The purpose of castration was to unsex the individual. The purpose of sterilization is to prevent parenthood without unsexing the individual. Hence anyone who has intelligence enough to realize his situation, who feels that he should not have children, or should not have more children, welcomes the sterilizing operation. *He has no reason to fear it, for he knows*

that it will produce no inconvenience in his life to counteract the benefit which will result, in his case, from infertility.

The operation in the male is almost bloodless, requires only 15 to 20 minutes, and can be done under local anesthetic. In the female the abdomen must be opened, hence the operation requires a general anesthetic and two weeks or more in the hospital. It is therefore about equivalent in speed of recovery and in relative simplicity to an easy operation for chronic appendicitis. Because of this difference in the seriousness, and the cost, of the operation in the two sexes, the tendency is toward operating on the male rather than the female in many cases where a family should not have more children.

Few inmates are allowed to leave the California state homes for the feeble-minded without sterilization, and more than one-fifth of the total number of operations in the state have been on the feeble-minded. In the state hospitals for mental diseases, since the sterilization law went into effect, only one new admission in each eleven has been sterilized. In recent years, when the law has been used actively, one out of each five or six has been sterilized. Operations are divided rather equally between the sexes.

The California law provides that the operation shall be compulsory in case the medical superintendent of the institution thinks that, without sterilization, the patient would probably be the parent of defective offspring; and provided his judgment is ratified by the director of the State Department of Institutions and the director of the State Department of Public Health. But in practice, it has been the custom to get the written consent of the nearest relatives, when there are any such; and this has not proved to be a difficult matter. Not in one case out of ten, if not one case out of twenty, where near relatives are known, has the operation been performed against their will. It is becoming more and more frequent that the relatives are the first to ask that the patient be sterilized before he or she is released. In the case particularly of the feeble-minded, it is often for that very purpose that the patient is committed.

It is evident that much can be and is accomplished with a law that is purely voluntary and permissive. Nevertheless the state, at its own discretion, should have full power to act. There are several reasons: there are often no known relatives; or the relatives may have no more competence than the patient, hence their approval or disapproval may be of little value. Finally, it is not uncommon that the relatives of a mentally diseased person, not knowing how he will react later to the fact of sterilization, wish to wash their hands of the whole matter. They desire that sterilization be performed, but also desire not to go on record in favor of it. They therefore say to the superintendent, in effect, "Go ahead and use your own judgment. Of course he (or she) ought to be sterilized, but we don't want to be responsible."

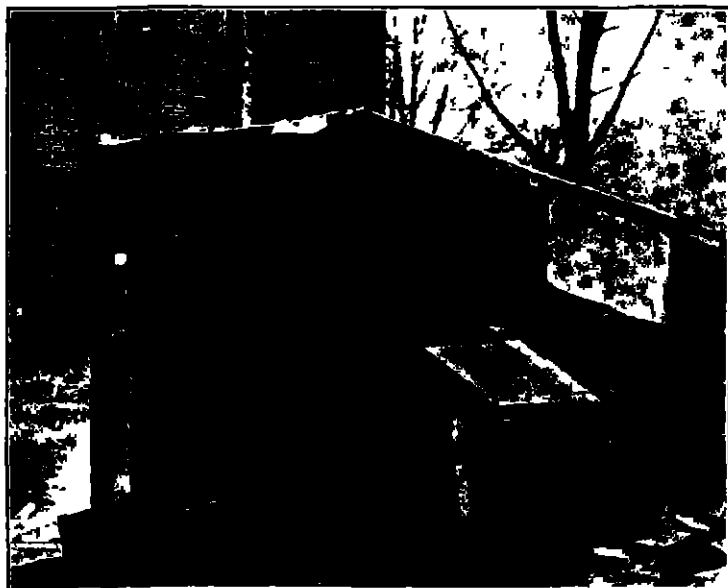
Not only are the relatives of sterilized patients, in general, satisfied with the workings of the law; not only are the social workers, probation and parole officers of California virtually unanimous in favor of it; but what is perhaps less expected, the sterilized patients themselves are generally satisfied, often greatly pleased, with the results. The investigators did not seek the opinions of the feeble-minded, considering these of little value. But of 178 insane patients who gave statements, six out of every seven were either indifferent or pleased; only one in every seven expressed any regret, and the reasons for this were in no case cogent. The working of the law in California, then, may be said to have the indorsement of public opinion.<sup>47</sup>

The principal objections which have been urged against eugenic sterilization by those who have little or no knowledge of its actual operation, were found to be largely imaginary.

1. It has been urged that the state has no right to assume that it has discharged its duty to its defectives by sterilizing them and turning them out to stand or fall in open competition with the more normally endowed members of the community, which is equivalent to saying to them, "Now that you can not produce defective offspring we have no further concern with you. Look out for yourselves." No state ever has adopted



and probably no state ever will adopt, such a policy. Sterilization is only one feature, though an important one, in a complete and well-balanced system of state care for the defective and mentally diseased. It enables the parole of many who



A HOME OF THE "HICKORY" FAMILY

FIG. 31 —To this shanty an elderly man of the "Hickory" family, a great clan of defectives in rural Ohio, brought his girl-bride, together with his two grown sons by a former marriage. The domicile was conveniently located at a distance of 100 feet from the city dump where the family, all members of which are said to be mentally deficient, got their food. Such a family is incapable of protecting either itself or its neighbors, and should be given appropriate care by the state. Photograph from Mina A. Sessions.

without it could not be wisely paroled. Homes which would be broken, if continued childbearing were inevitable, can be kept together after sterilization of one partner. Moron girls, whose racial contribution the state could not contemplate with equanimity, may after sterilization be allowed to marry. They are able to meet the slight responsibilities of a home which con-

tains no children, especially if the wife as well as the husband works out, thus supplementing the family income. If the wife were at home, bearing a child every two or three years, the burden of support being thrown on the inadequate earnings of a husband who is, from the standpoint of intelligence, usually not much different from his wife, the result would be too often that with which social workers are so familiar: After a few years the husband becomes discouraged and deserts the home, leaving his family to be cared for by the public charities

A study <sup>123</sup> of 125 marriages of girls of this type showed that two-thirds of them turned out well, the criteria of success being that the marriage should be (1) monogamous, (2) law-abiding, (3) self-supporting or supported from some legitimate source, and (4) apparently happy. This, if applied to all the marriages in the community, would be found to be a fairly high standard. It is doubtful whether more than two-thirds of the unsterilized sisters and cousins and aunts of these girls make a success in marriage.

2. It is argued that the sterilization of defectives is simply putting a premium on their promiscuity and is therefore contributing to the disintegration of the monogamous ideal, while creating just so many new foci for the distribution of venereal disease. This objection has again been found to have no validity.<sup>123</sup> Among the sterilized insane in California, only one case was found where a patient tried to use the fact of his sterilization as an argument for promiscuity. Among the sterilized feeble-minded males, not a single case of the sort has arisen. (The feeble-minded male of the type that gets into state institutions is not characteristically a sex offender. He is lacking in drive and aggressiveness, even if not undersexed physiologically.)

The feeble-minded female of the type that is committed to state institutions is characteristically a sex delinquent. This is one of the reasons why she is committed. If she had behaved herself she would have been kept at home in many instances. Of the girls in this study, who were paroled after sterilization,

nine out of every twelve had been sex offenders before commitment. On the other hand, after these girls have been sterilized and paroled, only one out of every twelve has been a sex offender. There has been a reduction of eight-ninths in the delinquency of the group.

This can not be said to be wholly due to sterilization. The fact remains that, under the careful system of parole and supervision, of which sterilization is in California now an essential part, the amount of delinquency has been kept down satisfactorily. And in cases where the girl did stray from the path laid out for her, she was usually detected quickly and returned to the custody of the state home.

The social workers, probation and parole officers of the state were canvassed to find whether they knew of instances in which "the fact of sterility with consequent absence of all fear of pregnancy or bastardy seemed to have acted as an incentive to promiscuity, adultery, or other anti-social conduct that would not have occurred had it not been for the sterilization." Only half a dozen possible cases were cited, and in two of this number of which full knowledge was available, it was clear that the delinquency would have occurred just the same regardless of the operation. But if all six subsequent delinquency cases be attributed to the effect of the sterilizing operation, they furnish a delinquency rate of only one in a thousand. And with steadily increasing wisdom in the selection of patients for parole, and in their excellent supervision after they are paroled, there is no reason why even this trifling rate should not be cut down.

Granted there is proper selection and parole of patients, the idea that sterilization will lead to an increase in promiscuity is unwarranted. Results thus far prove the reverse to be the fact.

3. It is often alleged that sterilization is unjustifiable at present because the exact mode of transmission of most hereditary defects and of mental diseases is not known with sufficient certainty. This objection again misses the mark. In the

first place, there are certain cases in which all informed persons will agree as to the desirability of sterilization. When the petition of a feeble-minded woman who had an illegitimate feeble-minded child, and whose mother was also feeble-minded, was carried up from Virginia to the United States Supreme Court to test the constitutionality of eugenic sterilization, Justice Oliver Wendell Holmes who wrote the Court's decision upholding the law said bluntly, "Three generations of imbeciles are enough." If there is any doubt at present about the necessity for sterilization, and if the patient objects, give him the benefit of the doubt. There will be plenty of uncontested cases to keep the surgeons busy for a long time to come. With the progress of research, the number of cases in which there is no room for doubt will increase from year to year.

The objection that sterilization of defectives may prevent the birth of genius is hardly worth refutation. This presupposes that genius is closely related to insanity, sometimes, as lately by Sir Philip Gibbs, that genius is akin to imbecility! This old superstition dies hard. It is doubtful whether a single instance can be cited in the whole range of history in which the sterilization of an individual, by the standards that are now being applied in California, would have prevented the birth of a genius. And where is the genius whose parents were imbeciles?

Horatio M. Pollock has shown that 4.5% of the native-born population of the state of New York will at some time during life be committed to one of the state hospitals, as insane.<sup>112</sup> Probably a similar figure would hold good for the American population as a whole. S. J. Holmes found that from 2% to 4% of the recognized men of genius in history had been insane.<sup>70</sup> In other words, the chance is greater that a random "man in the street" will go insane than that a man of genius will. Most of the cases of insanity among eminent men have been found in those connected with the arts. Some of these insane men have been of very doubtful value to humanity. Among eminent men of science, engineers, or constructive statesmen, the per-

centage of mental diseases would be much smaller than in art and literature.

Even though some eminent men have come from stocks having some individuals with mental disease, no one can successfully deny that the chance of the production of an eminent man is greater in a sound than in an unsound stock.

Finally, the majority of the persons officially sterilized in California have been from the group of unskilled labor. Numerous investigations have shown that this group makes a very slight contribution to the lists of genius.

It may be said with some confidence, then, that no embryonic Shakespeares or Aristotles are being cut off by modern eugenic sterilization. On the contrary, if the burdens imposed on society by the proliferation of defectives can be reduced, it may be possible to bring about an increase of reproduction among intellectually superior people, whence the great men of history have usually arisen.

Finally, it is alleged that even if the offspring of mentally diseased and defective individuals may not qualify for the Hall of Fame, many of them will be normal, useful individuals. Granted that this were true, will they be benefited, or will *anyone else be benefited, by having them born to be brought up by insane or feeble-minded parents?* Is the nation in such desperate need of average, normal individuals as deliberately to encourage their production under these circumstances? And in the light of modern mental hygiene, what will be the condition of these supposedly average, normal children after their *insane or feeble-minded parents have finished with them?*

It is agreed that many insane and feeble-minded persons are the offspring of parents who are themselves apparently normal. But this has really nothing to do with the case. The fact that sterilization will not prevent the birth of every misfit is no argument against using it in cases where it will unquestionably prevent the birth of some misfits. The alleged inadequacy of modern knowledge of heredity is no argument against the application of compulsory sterilization in certain cases.

But beyond this, twenty-five years' experience in California leaves no doubt that the bulk of all sterilization can be made voluntary. Indeed the problem in this state at present is not



A CHIEFTAIN OF THE "HICKORY" CLAN

FIG 32.—This is "Young Hank," otherwise known as "Sore-eyed Hank." He is the eldest son and heir of that Hank Hickory who applied for admission to their County Infirmary, when it first opened. For generation after generation, his family has been the principal patron of all the charities of its county. Young Hank married his cousin and duplicated his father's record by begetting seven children, three of whom (all mentally deficient) lived to maturity. The number of his grandchildren and great-grandchildren is increasing every year, but cannot be learned from him as he is unable to count beyond the fingers of one hand. Such families are found in every state; their perpetuation should be prevented. Photograph from Mina A. Sessions.

so much to sequester proper subjects for sterilization, as it is to establish facilities for the sterilization of those who want to be sterilized, or who ought to be sterilized, but for whom there is no proper provision at the present time. Many persons who

desire sterilization do not care to purchase it at the cost of being legally committed as insane or feebleminded. In the absence of any law governing the matter, however, most public hospitals do not feel confident of their rights in accepting for sterilization a patient who is not palpably in need of hospitalization. Laws should therefore be adopted, specifically authorizing the superintendents of these institutions to accept patients for this purpose.

This would meet the needs of patients who can not afford to pay for the operation. Those who can afford to pay usually find little difficulty in getting sterilization performed, but in most cases these operations in private practice have been on women, primarily because another pregnancy would endanger their life. A study <sup>133</sup> of 425 such operations, which was made in coöperation with the Los Angeles Obstetrical Society, showed that nine-tenths of them were, at least ostensibly, based on the existence of a bad heart, lungs, or kidneys, a narrow pelvis, repeated Caesarian sections, or some similar obstacle to child-bearing. Only one in every ten was apparently eugenic in motive.

The number of sterilization operations in women is being increased by a ruling which many hospitals have adopted, that they will not perform an abortion unless they sterilize at the same time. Under existing laws and medical ethics there are certain cases in which they are not justified in refusing to perform abortions. But they take the position that if a woman's condition is so serious that she can not carry a pregnancy to full term, she should not be coming back every year or two with the same story. She should be sterilized. Usually, of course, the patient is the first to desire this.

From all that has been said, it will be fairly clear that the problem of eugenic sterilization, as it works out in practice, is quite different from what it has been conceived by many critics who have no first hand knowledge of it. It is not a question of the establishment of an inquisitorial body which will send its spies out through the population to catch those

who do not conform to some standard laid down by the ruling powers, and to drag them protestingly under the knife. The great majority of the sterilizations performed are not only done with the full consent, but with the earnest desire, of those most closely affected.

If an individual has been committed, after due process, to an institution for the mentally defective or mentally diseased, as a public charge, and if there appears to be no room for doubt that further reproduction on the part of that individual would be undesirable both to the individual, to his or her family, and to the commonwealth, the state is certainly justified in operating. As Justice Holmes remarked in writing the decision of the Supreme Court, the state does not hesitate to demand that the most useful of its citizens lay down their lives on its behalf in time of war. It should certainly have no less right to call on some of the less useful citizens to make the very slight sacrifice,—if it is a sacrifice, and in most instances it is quite the reverse—of surrendering their reproductive capacity for the public good in time of peace.

Apart from these individuals who have become public charges by reason of their incompetency, the number who recognize their own disqualifications for parenthood, or whose relatives recognize it on their behalf, is great enough to provide as many patients as can now be handled conveniently in most communities. This is a group whose needs the teaching of contraception can not meet. The birth control clinics report varying percentages of failure among their patients, and it is probable that the least intelligent, not the most intelligent, of the women predominate in such pregnancies. Further, after a careful survey, Norman E. Himes concluded<sup>66</sup> that the birth control clinics "have been powerless so far to limit the reproduction of these fertile individuals in the community who constitute a serious problem—the feeble-minded, the insane, the chronic paupers, and the persistent leaners on the State." It is only in the nature of things that they should fail to do so. But if persons whose offspring will be dysgenic are so lacking in in-



telligence, in foresight, or in self-control that they do not control themselves, the state must control them. Sterilization is the answer.

The dissemination of knowledge about sterilization—that it is a simple, non-mutilating operation which does not alter the individual's life in any respect except by preventing parenthood—has led to many voluntary demands for sterilization, as shown above. With further publicity no doubt many more persons would take advantage of such voluntary sterilization, with eugenic results.

The prerequisite to the adoption of further sound measures and their wise and conservative administration in the near future in other states, seems to be the general dissemination of information as to what has actually been done—particularly in California, the one place where the experiment has been carried on long enough and on a sufficiently large scale to furnish trustworthy conclusions.

This experience of California seems to furnish a safe guide for other communities, and to show that the state is not only justified legally, as the United States Supreme Court has declared, but practically, in trying to protect its future by cutting off the reproduction of such of its public charges as are likely to have offspring who would be liabilities rather than assets. If such a law is wisely administered, it will win the support of public opinion. If the patient is given the right to appeal,—to have his "day in court," in case he objects to sterilization,—no individual interests are likely to be jeopardized. The effectiveness of the law depends largely, however, upon the extent to which public opinion is educated to its purpose; hence the need for dissemination of the facts, which the Human Betterment Foundation and many other agencies and individuals are now undertaking.

Apart from these institutional cases, it is found that there are many individuals who should be sterilized and who want to be sterilized, but for whom there is no provision under existing laws. We have already suggested that a law empowering pub-

lic hospitals to receive such patients would meet the needs of the most important part of this group.

The rights, responsibilities, and liabilities of a physician who in his private practice sterilizes an individual for eugenic reasons are at present uncertain. Sterilization is too new an idea to have found its place in jurisprudence, and where it has received any consideration, this consideration has been casual and superficial. Good legal opinion holds that, in states where there is no law expressly forbidding it, a surgeon is justified in sterilizing any patient who desires it. Socially, it would doubtless be an advantage to have such operations controlled by the state, or at least recorded. Whether a law to this effect could be enforced if passed, is open to question.

These uncertainties do not interfere with the conservative application of sterilization under state control, along the lines outlined in the preceding pages. Sterilization is no panacea, but it is one of many useful measures that make up a modern program for dealing with social problems. Most of those who are familiar with its operation in California regard it not only as a useful measure, but also as an indispensable one. Selective sterilization is certain to spread and to be one of the most discussed social measures during the next decade or two.

## CHAPTER X

### SELECTIVE CONTRACEPTION

A nation may be underpopulated in proportion to its area, its resources, and its neighbors, or it may be overpopulated. For every people there is an optimum representing the number of persons that can most profitably be accommodated in a given territory under given conditions. While this optimum number is not capable of precise measurement, its existence has yet been recognized, more or less consciously, in all ages, and every group has attempted in one way or another to regulate its numbers according to changing conditions. This attempt gives rise to one phase of the population problem.

The means of control have been manifold, working sometimes through the marriage rate, when higher age limits were set, or when some were denied the privilege of marriage; other times through a lower birth-rate, effectively accomplished by infanticide, by abortion, or by the prevention of conception. More or less effective measures to gain the object last named have been used in every age and in every part of the world.

To say that the use of such methods is the cause of the general decline in the birth-rate of civilized nations, which has been conspicuous during the last half century or century, is only in part true. Contraception is one particular method by which populations have made their intentions effective. The reasons that lead them to adopt this or any other method should rather be sought as the true cause of the declining birth-rate.

As to the decline itself there is no doubt, and the figures have been published so widely that it is not necessary to do more than refer to them. Following the Industrial Revolution (which in point of time coincided with the American Revolution) there was a rapid increase in population in almost every

European country. As usual, most observers could not realize that this was not going to last forever, and the Rev. Thomas R. Malthus, in particular, based his much-discussed but little-read book on the assumption that the birth-rate would continue to increase forever. But in France, where civilization had perhaps made the most progress, the birth-rate quickly began to decrease until for the past half century the natural increase of the French people has been virtually nil. Indeed, in recent decades the population of France would actually have decreased had it not been for immigration of peoples with a higher birth-rate.

In other countries the decline began not much later, and has been greatly accelerated since the opening of this century, and still more since the end of the World War. The result is that virtually every country in Western Europe has now reached the end of the era of natural expansion.<sup>147</sup> The countries are still growing slowly, because of a carry-over of women of child-bearing age from an earlier period of greater fecundity, but as these women pass childbearing age they do not leave enough daughters to take their places. Every European nation will therefore, in a few years or a few decades, have a birth- and death-rate rather evenly balanced, unless the trend becomes actually downward, as is believed by many to be more probable.

Similar conditions are found in the United States. The natural increase of the population was fairly high during colonial times, but about the period of the War of 1812, the native white population in New England began to have fewer children, and for a long time it has probably not been replacing itself.<sup>148</sup> This situation has been masked by the continual influx of foreigners with higher birth-rates. While the birth-rates of these new immigrants dropped after they became Americanized, still new streams were ever arriving, and the census continued to show a rapid increase of population.

The shutting off of immigration into the United States since the World War has given statisticians an opportunity to survey the situation more carefully, and it is now recognized that

the natural increase of the population of the United States has come nearly to an end. The present abnormal age distribution of the population, due to the carrying-over, from an earlier period, of a larger proportion of women of childbearing age than is now being produced, means that the population will continue to show a statistical increase, though slowly, for some time yet. But most persons now in college will live to see the population of the United States actually come to a standstill and then, according to the present outlook, slowly begin to shrink.

But this process is not taking place everywhere at the same rate, and it is important to recognize the differential nature of the birth-rate, for that is the main factor of eugenic interest.

In the first place, the birth-rate has declined much more rapidly in the cities than in rural districts. This difference seems to have been noted in every country and in every age. Cities have always been consumers, not producers, of population. They draw from the surrounding country some of its best stock. Under city conditions this stock does not reproduce itself, as it would have done had it stayed in the country. The effect of city life therefore has always tended to be racially unfavorable. Urbanization intensifies all the social and economic factors that hinder the normal development of family life, and the problem of eugenics is therefore to a considerable extent the problem of dealing with urbanization.

In the second place, there are great racial differences in the birth-rate, though these are to a large extent functions of social and economic differentiation, rather than racial in a biological sense. These are spoken of in Chapter XVI. The Jews deserve special mention in this connection. They are not a race but a socio-religious group made of various races, and of widely differing composition in different parts of the world. The Polish Jews, who make up the bulk of American Jewry, are largely of Slav and Oriental origin, with little genetic kinship to the ancient Hebrews. In several civilized communities it has been found that the birth-rate of the Jews is lower

than that of surrounding Gentiles of the same economic level. In addition to this, a considerable proportion of marriages of Jews are with non-Jews, and the children of such unions are usually not brought up as Jews. It appears, then, that the break-up of the ghettos and the abandonment of segregation may have written the death warrant of the Jews as a separate group, and that their racial contribution, so far as it is not being allowed to die out, is being merged rapidly with that of other races.

On the whole, the only part of the United States in which the old native white population is now reproducing itself is on the farms of the southern states. The most serious dysgenic trends are in the cities and between the groups. Thus while the best engineers, teachers, physicians, or business men have more children than do the least successful engineers, teachers, physicians, or business men, any group of engineers, teachers, physicians, or business men taken as a whole has perhaps no more than half as many children, per marriage, as do the groups of agricultural laborers, or coal miners, or dependents on public charity, taken as a whole. It is this differential interclass birth-rate that is the most menacing feature of modern civilization to the eugenicist.

Going back to the causes of this situation, one finds remarkably little satisfactory evidence. Since a larger part of the population is married than in earlier decades, and people are also marrying earlier, the declining birth-rate is evidently due to the fact that married people are not having as many children as they used to. This must be either involuntary, due to sterility, or voluntary, due to contraception, or abortion, or surgical sterilization. Presumably the explanation varies with various cases. The involuntary childlessness has been considered in connection with a discussion of natural selection (Chapter VI). Here the voluntary cases remain for consideration.

Sterilization, usually performed for reasons of health rather than eugenics, accounts for some diminution. Abortion doubtless accounts for much more, and in some European cities,

notably Berlin and Moscow, is an important factor. What the real extent of it is in the United States can not be determined because no record is published in such cases. Conservative estimates put the number of abortions in the United States at several hundred thousand annually. Eleven of the most competent specialists in the United States, appointed as a committee by the White House Conference in 1930, surveyed the situation for months and reported that the number of abortions was probably decreasing from year to year.

On the other hand, abortions have an effect beyond the particular pregnancy that is terminated, because they so often prevent future childbearing by the same woman. This may be due to death, to infection, to damaged reproductive organs, or to glandular disturbance.

In the opinion of virtually every student of population, however, all other voluntary factors put together are of much less importance than the deliberate prevention of conception by married people. Since "birth control" is only a means to an end, the question why people use contraceptives has been widely debated.

If intelligent people are asked why they have had only a child or two, the most frequent answer is that they want to have only as many as they can afford to educate well, by which they mean a college education. The next most frequent answer is that it is because of the wife's health. Such answers evidently do not go far below the surface, and a complete analysis would be beyond the scope of this book, but it must be emphasized that the causes of family limitation are numerous, fundamental, and inherent in the modern social structure.

Such factors as the growth of cities at the expense of the country and the consequent disturbance of the equilibrium of population, the employment of women, the general improvement of hygienic conditions, the increased standards of living and the greater desire for luxuries, the increasing availability of and demand for expensive medical care, the decline of religious inhibitions and the changed attitude toward family

life in general, the increased feeling of independence and self-determination on the part of women, the increased sense of parental responsibility toward children, the fact that children are not an asset as they were on the pioneer's farm, but a financial liability, and a score of other reasons that will occur to the reader, have made for the employment of *contraceptives* in marriage by almost every one who knows about them and can get them. It is dangerous to try to compress all these factors into one formula, but if one tried to do so, it would perhaps be found that many of them could be brought together under some such head as that of social ascent, or the desire to better oneself in life.

With the philosophy that has grown out of modern civilization in large cities, people were ready to take greater interest in the use of *contraceptives* in the last century than they have in some other centuries. In the United States a violent attack was made on various laws that attempted to restrict the dissemination of *contraceptive information*. No matter how justifiable such legislative campaigns may have been, they tended to divert attention from more important objectives, such as

(a) research to find the most effective and feasible methods of contraception,

(b) more general education of the medical profession on this subject, and

(c) to get the existing information and supplies to those who need them. This last requirement is complicated because no one method alone, of the many now known, is equally suitable for all persons, or for any one person at all times. This service can well be made part of a general medical service and included in the regular out-patient activities of hospitals, as well as in the usual services of physicians in general practice. For the large group of persons who can not afford to consult a private physician, but for whom contraceptive information is often of great importance, the Los Angeles County Department of Health began in 1926 to establish a contraceptive service as part of its regular clinics. This continued until it had a



score of such services in various parts of the county and the best available contraceptive information had been brought within easy reach of any indigent resident who had need of it. Although it was years before any other health department followed this example, it is recognized as one of the most effective procedures at the present time.

It must not be supposed that any one known method of contraception is 100% successful. Success depends on care, forethought, and self-control, as well as on the merits of any one particular technique as against those of another.<sup>28</sup> Because of a tendency on the part of enthusiasts to exaggerate the merits of specific proposals, many persons have found themselves disappointed. In some cases, persons who have used contraceptive methods have reported having more abortions performed than did those who never used any such method, because of overconfidence.

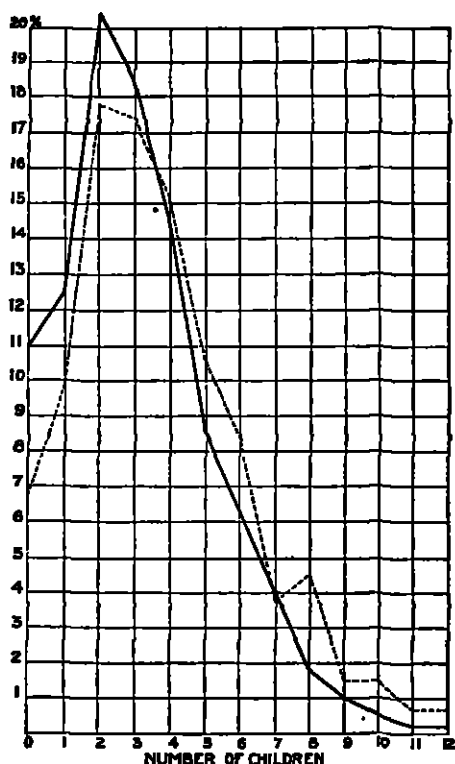
Methods of contraception are now available to every intelligent person, and the spread of "birth control" clinics is bringing them within reach of persons even in the lowest levels of intellect and the lowest social and economic strata.<sup>128</sup> What further results are to be expected as a result of this situation?

The arrival of a stationary or decreasing population is being hastened by the practice of contraception. The results of this will be to produce a population with an age-composition much different from that to which the United States is accustomed. At the time of the Civil War, half of the inhabitants of the United States were youths under 20. By the time the centenary celebration of that conflict arrives, perhaps no more than one-fourth of the population will be under 20. The middle-age group will not vary so much, but the proportion of people over 50 will increase, more than one-fourth being in that group as compared to less than one-tenth at the time of the Civil War.

The social and economic results that are bound to be associated with this great change in the make-up of the population are matters for speculation. Students are by no means agreed as to the most likely consequences. Certainly there will be

widespread changes both in the kinds of goods to be produced, and the make-up of the organizations that produce them. It will be absurd, for instance, to talk about the unemployability of men over 40, as has sometimes been done, when nearly half of the population is over 40. On the whole, the population will be less vigorous, less rapidly adaptable. One-eighth of all married women are employed gainfully outside the home (census of 1930), but this proportion will increase markedly unless widespread measures to prevent it are adopted. The further invasion of business and politics by women will produce far-reaching results that will be highly interesting to watch. Taxation will be much increased if the movement toward old-age pensions and such social measures continues. The stationary population, made up largely of elders, will be a factor working for conservatism. The liberal tendencies of youth will be greatly in the minority and, if they are to find any expression, may have to be presented more forcibly than in the past. This may make for greater social unrest. The decrease in the number of young people will relieve the strain on the educational system, which has been hard pressed to keep up with the demand for more schools and more teachers. Already in the 1930 census the effects of the falling birth-rate were shown in a decrease in the number of kindergarten children, as compared with 1920. The 1940 census will doubtless show a falling off in the numbers of children in the elementary grades, while by 1950 the high school and college students will also begin to decrease in numbers. This trend will throw many teachers out of work but should also make possible more intensive and effective education. It will probably be counterbalanced by a more widespread development of adult education.

It is claimed by birth control advocates that the spread of contraception will cut down the infant mortality rate. This claim is based on the fact that infant mortality has been shown in many studies to be high in the economically depressed parts of the population, where also the families are large. If these poor parents have fewer children, it is argued that they will



FAMILIES OF PROMINENT METHODISTS

FIG 33—The heavy line shows the distribution of families of prominent Methodists (mostly clergymen) who married only once. Eleven per cent had no surviving children and nearly half of the families consisted of two children or less. The dotted line shows the families of those who married twice. It would naturally be expected that two women would bear more children than one woman, but a second wife, following the death of the first, means the addition of only half a child to the average Methodist household. Presumably the birth-rate in these families is determined more by the desire of the parents (influenced by economic and other considerations) than by the natural fecundity of the women. In other words, the number of children is limited to those whom the minister can afford to bring up on his inadequate salary.

be able to take better care of them, and that the saving in infant mortality will be a real gain to the nation.

This argument is partly a confusion of cause and effect. Reduction of the birth-rate doubtless cuts down infant mortality in many instances; but reduction of infant mortality also cuts down the birth-rate. If a baby dies immediately after birth, the mother is likely to become pregnant again in a shorter time than would elapse if she nursed the baby for six months or a year. Beyond this, infant mortality is related to the inherent fitness of parents. Their poverty is also related to some extent to their inherent inferiority. Poverty and infant mortality therefore do not stand in the direct relation of cause and effect, as is sometimes claimed, but to a marked degree they are both effects of the same cause, namely, inherent weakness. This is proved in a variety of studies, such as those of the long-lived people whose pedigrees were collected by Alexander Graham Bell.<sup>126</sup> In this inherently superior stock neither poverty (in the sense of pioneer conditions and lack of the advantages of urban civilization and modern science) nor large families involved a high infant mortality, for the infant mortality was extremely low with both of the other conditions present.

Spread of contraceptive knowledge is most frequently urged as a desirable eugenic measure on the ground that it will tend to level out the undesirable interclass differential that now exists. Intelligent and prosperous people, it is argued, already have access to contraceptive knowledge, and are limiting their families. If this knowledge is made equally accessible to unintelligent, poor people, they will limit their families equally—indeed it is argued they will have even greater reason for doing so. The lower half of the population might therefore cease outbreeding the upper half of the population, and if the expected trend goes far enough, the poorest and least efficient families will naturally tend to have the fewest children. The intelligent and well to do will naturally tend to have more, so that the whole differential birth-rate which is the most serious dysgenic factor in modern civilization will be reversed.

In support of this contention, data are brought forward from several large continental cities where this condition actually appears to have arrived. The following figures <sup>164</sup> show the birth-rate in one of the wealthiest and one of the poorest quarters of Berlin (the Tiergarten and the Wedding quarters respectively):

Birth-rate per 1,000 inhabitants in	1909	1910	1911	1912	1926
Rich quarter	15.2	14.9	14.1	13.8	10.4
Poor quarter	31.8	29.6	27.4	26.4	11.8

Here, it will be seen, the poor quarter not long ago produced twice as many children as the rich quarter; now the rich quarter actually produces almost as many children as the poor quarter. Assuming that there is at least some correlation between economic success and inherent fitness (see Chapter VI), the change that has taken place is one that is eugenically of great advantage. A similar change is reported from Stockholm, where the wealthy sections of the city now produce more children than do those inhabited by the poor<sup>165</sup>, and a similar tendency is evidenced elsewhere.

The assumption that this change has been brought about solely by making contraceptive information available to the poor is of course incapable of proof. Presumably that has been one important factor, although the changes may depend to a considerable extent on the spread of abortion, venereal diseases, and other factors. On the other hand, there is probably no city where contraceptive information is more freely accessible to every one than London, and the changes in the birth-rate there have not kept pace with those in Berlin and Stockholm, just mentioned.

Evidently it is not enough, merely to stop suppressing contraception. To improve its eugenic action the service and supplies must not merely be accessible in clinics, but must be actively brought to the attention of the people who need them, and probably furnished free of charge. A public health nursing service should provide such facilities promptly for parents who

are dependent on public charity. Parents whose children are found, in the public schools, to be mentally retarded should have the same service, which would in turn be available to these dull children when they grow up and marry. From the eugenic point of view, the principal function of contraception is to serve the needs of the dullard. The very fact that he is dull means that special effort must be made to put the necessary facilities at his disposal.

While it is thus desirable to give contraceptive information where it is needed, it is a mistake to assume that this will solve all the problems of eugenics without further effort. Many families are too careless, indifferent, unintelligent, alcoholic, or mercenary to restrict their own birth-rate effectively. In many cities every additional child brings an additional allowance from the public charities, and is therefore an asset rather than a liability to the parents.

Moreover, it must be noticed that in the cities above mentioned, the differential has been reduced by a decrease in the birth-rate of the poor. While the differential is thereby removed, the total birth-rate is left at a point below that necessary to keep the population from dying out. Unless such a remedy is accompanied by a thoroughgoing and effective program of positive eugenics it will be a remedy which is worse than the disease.

In addition to the interclass differential within any one nation, there is also the international differential. Suppose that a people succeed, by such measures as have just been described, in eliminating the differential, but at the price of bringing about a steady shrinkage of the entire population. How will this affect them in competition with other nations? This is the situation that many nations now face and that France, in particular, has faced with growing anxiety for a generation or two. France has long been stabilized at a population of about 40,000,000, and there seems no likelihood that this figure will be exceeded within the next generation. Italy, on the other hand, has set about desperately to increase her population to 60,000,000 within the next generation. If she should do so,

France would look at Italy as a dangerous neighbor. What will be the position of Germany as its population declines if Russia grows apace under the Bolshevik teaching that every woman owes four children to the world revolution? What will be the position of the whole western civilization if it begins to die out numerically, as seems quite probable, while the Orient increases steadily in population?

Such questions are not pleasant to face. They involve problems of nationalism, of economic competition, and of war, which are extremely repugnant to many thinkers. Yet the realist must face them fearlessly and guide his conduct accordingly. It is worse than useless to evade the issue by denouncing "international baby competitions to see who can produce the most cannon fodder." Such an emotional reaction does not solve the problem, but merely lulls its victims into a sense of self-satisfaction.

To a marked degree, the strength of a nation depends on the quality, not the quantity of its population. If a declining birth-rate makes for a marked increase in the average fitness of the population, eugenically speaking, it may strengthen a people by eliminating sources of internal weakness. On the other hand, *such a situation as that which now faces every civilized nation* demands in the most imperative terms a far-reaching and thoroughgoing program of eugenics, in order to assure continued improvement in quality, rather than steady deterioration in quality and quantity alike.

Beyond this, it has been proposed that nations which do not aspire to a show of strength merely by a high birth-rate and quantity output of population might form a World League of Low Birth Rate Nations, or something of the sort, to act in common with a view to maintaining adequate standards of living and to prevent themselves from being overrun and destroyed, one at a time, by larger and more fecund neighbors with lower standards of living. The history of international relations during the last generation gives little ground for hope that the civilized nations would cooperate effectively on this

or any other basis. But the idea is sound, for the principal western nations differ so little from each other in inherent quality that damage to any one of them is damage to the species, which will eventually be felt by all

Another suggested line of international action is to accelerate the decline of birth-rate among competitors, so that all will fare alike in this respect. To protect themselves in this way the occidental nations would have to show a true missionary zeal in spreading a knowledge of contraception through overpopulated countries. One serious difficulty hampering such a course is the unsatisfactory nature of the present means of contraception, whether mechanical or chemical. Most of them require some intelligence, some foresight, and some expense. Largely for this reason rapid progress of contraception in the Orient has been confined to seaports and great cities. However, the movement is making progress in Japan as rapidly as in some parts of the United States, a fact that suggests that there is no unsurmountable obstacle to progress of this sort in the Orient. Probably some entirely new type of simple, inexpensive, and "foolproof" contraceptive will have to be found before the masses can be reached effectively

Suppose a nation does not want to be evangelized in this respect, and repels the new knowledge as vigorously as some heathen peoples used to drive out Christian missionaries. In the long run perhaps "truth will prevail," but it might not prevail soon enough to prevent grave consequences. Italy has already taken stern measures against contraception, the determined power of the state being reinforced by the equally determined power of the church, in this case. Italy's experience encourages those who believe that the spread of contraception can not be checked, since the official measures used there seem to have had little effect. The Italian birth-rate has risen a little, it is true, but this is perhaps due more to the cutting off of emigration and other measures of that nature, than to the actual production of more children per family than would otherwise have been the case.



The Soviet Union is actively spreading contraceptive knowledge in the cities, primarily as a means of combating the evil of abortion. This has of course greatly reduced the urban birth-rate and this decrease will continue. Published statistics, never quite up to date, show a high birth-rate in the country. The rapid conversion of the peasant into a worker on a collective or state farm, however, seems to reduce the rural birth-rate as the new status brings the farmers more adequate medical supplies and service. Some Soviet leaders would like to hold back contraception in the country, presumably for military reasons, but it is not likely that this will be done. In personal matters, *individualism runs high in the Soviet Union.*

The populations of China and India and other parts of the Orient have been at a standstill, or nearly so, for several centuries, as the natural increase has been balanced against the high death-rate. With reduction of disease through the introduction of modern medical science, indications are that the death-rate will fall much more rapidly than the birth-rate, so that they are potentially at the beginning of an era of rapid numerical expansion, provided deaths from civil war and starvation can be reduced. For this the outlook is not reassuring.

Japan has been growing rapidly ever since it was opened to western civilization. Seeking strength, the government long encouraged this increase of population, and even prohibited the giving of any contraceptive advice. Gradually, however, the Japanese came to see that an indiscriminating policy in this direction might not be for its best interests in the long run, and by 1930 the government had begun to allow the establishment of birth control clinics, and even to consider the introduction of eugenic sterilization.

The problem of contraception has often been thought of merely in terms of getting clinics started in the poor and congested districts of American cities. Such a view is *pathetically myopic*. "Birth control" can not be considered without raising issues of world-wide scope and bringing up problems of the most serious nature, many of which today appear very

difficult. Certainly this chapter can not pretend to solve them. But if the problems are to be solved, it will only be after they have received the attention and study of thoughtful people in every country. The student, therefore, will not have an intelligent grasp of eugenics unless he has considered these far-reaching modern problems of population.

In conclusion, what should be the program of eugenists in regard to selective contraception? Most of them feel that knowledge of contraceptive methods is an indispensable part of intelligent marriage, and that it should be made available to all who want it. At the same time, it is recognized that up to the present, no matter how great the personal benefits from contraceptive information, the eugenic damage that has resulted in the creation of the interclass differential birth-rate, is immense. To remove this differential it is necessary that society make much more vigorous efforts to bring contraception within the reach of the less efficient, less educated strata of the population. But even if this is successfully accomplished, it is only a negative accomplishment. It may prevent the birth of many undesirable children. It will not, however, bring about the birth of desirable children in strata of the population which are best able to produce such children, and which at the present time are not producing enough to replace their own numbers.

Indirectly it may help, if it reduces the amount of mental deficiency, of dependency, of crime and delinquency, as might well be the case. In such an event, with the burden of taxes somewhat diminished, the remainder of the population would be economically better off, and if social conditions and public opinion were favorable, it could have more children than would otherwise be wanted.

This merely serves, however, to emphasize the fact that the indiscriminate spread of contraception, no matter how advantageous it may be to individuals, is eugenically harmful in the transition period and must be supplemented by a strong positive eugenic policy. In this respect contraception occupies

a different position from eugenic sterilization as it is at present authorized by the laws of a majority of the states. Confusion results in eugenic discussions from the careless coupling of eugenic sterilization and "birth control" as if identical. E. S. Gosney has pointed out that while both these measures diminish fecundity (as do many other measures and conditions), the differences between them are greater than the resemblances, and he has further analyzed these differences as follows:

1. Eugenic sterilization is applied, for the most part, by the state, to persons who are irresponsible. Contraceptives are used voluntarily, and successfully only by persons who are responsible.

2. Eugenic sterilization is intentionally irreversible, permanent. Contraception is intentionally reversible, never permanent.

3. Eugenic sterilization carried out properly as under existing state laws, is dependable in results. No unwanted pregnancies or consequent tragedies can occur. Contraceptive methods of birth control depend for success on many variable factors. When not carefully applied under definite instructions from a competent, experienced physician, after examination, they often result in unexpected pregnancies, sometimes in abortions or other tragedies. This is especially true with the young and inexperienced. What succeeds with one person may not succeed with another.

4. Eugenic sterilization is ordered or permitted by the state, for the benefit of the state. Contraception is practiced by the individual, generally on his own initiative, and for his own benefit rather than for the benefit of the state or posterity.

5. Society assumes the responsibility in the application of eugenic sterilization. The individual alone assumes the responsibility in the application of contraceptive methods.

6. Eugenic sterilization starts where contraception stops. It is applied primarily to persons without the intelligence, emotional stability, or self-control, to handle contraceptives

successfully. In such cases, sterilization succeeds where contraception would fail.

Each measure has its place in modern society, but these places are not the same. In practice they apply to different classes of people and for different reasons. They should not be considered merely parts of one program. The interests of each will be promoted by frank recognition of its own limitations, and of these distinctions.

*Contraception inevitably works selectively. If it is to promote progressive evolution rather than to promote national deterioration, this selection must be made to act eugenically rather than dysgenically. This can be done by having contraception more widely used by the unfit than by the fit. This end can be gained only by a broad and comprehensive eugenic program in which it will be made not only desirable, but possible for the unfit to cut down reproduction, while it will at the same time be made desirable and possible for the fit to increase their reproduction. Selective contraception, therefore, can not be considered profitably apart from the consideration of eugenics as a whole.*

## CHAPTER XI

### MARRIAGE AND DIVORCE LEGISLATION

While the promotion of successful marriages depends more on education and on social and economic changes than on law, it is at least possible by appropriate laws to prevent some dysgenic marriages. Among measures that are useful under certain circumstances are the following:

1. Increase of the legal minimum age for marriage. A dozen American states still retain the old Roman provision under which a girl may marry at 12, a boy at 14. Even those who favor early marriages can not be enthusiastic about the marriages of children at such ages or even at considerably higher ages. Yet it is calculated <sup>54</sup> that there are in the United States 600,000 married couples, one of whom (usually the woman) was less than 16 at the time of marriage.

If one stops to ask what sort of people marry, or let their sons and daughters marry, at such ages, it will at once be evident that few of these marriages take place in the educated or prudent part of the population. Most of them are probably of Negroes, or in certain foreign-born groups, or in strata of the population with low educational standards, whose children do not and sometimes can not progress beyond the sixth or eighth grade. They are not, on the whole, from that part of the population that finishes high school, much less college.

Now those who marry thus early are getting a long start in reproduction. The girl who marries at 13 or 14 may have three or four children before the college graduate has even become betrothed. The result is that extremely early marriage allows and encourages the rapid multiplication of one part of the population at the expense of others; and that the part which is thus multiplying rapidly is not, on the whole, the part

characterized by the highest standards of intelligence, social outlook, or economic efficiency.

This handicap of the educated classes could be abolished either by promoting earlier marriage among them, or by promoting later marriage among the uneducated. Somewhat earlier marriage on the part of the educated would be desirable, but this can not possibly put them on a reproductive level with those who marry under 16. It is needful, therefore, to equalize conditions by raising the minimum legal age of marriage. This must be done gradually and with due regard to local custom and public opinion. The obstacles are not the same in every state, a fact that is an argument against a uniform federal law such as is sometimes proposed. At present, *the minimum age in every state might well be made 16 with the consent of parents, 18 without such consent.* Eventually, no one should be expected to marry at a lower age than 18.

The abolition of these child marriages would do a great deal to reduce the excess of eugenically inferior children. Since it is a measure that commends itself to most people on other grounds as well, there should be little difficulty about getting such legislation adopted where it is needed.

2. Another measure of the highest value is that requiring advance notice before a marriage license is issued. A typical law of this kind provides that both the contracting parties must present themselves at the county courthouse and apply in person for a license. One or the other of them must then come back not less than three (sometimes five) days later and get it. Meanwhile the newspapers have published the fact that a license has been applied for.

At first sight no law could appear more innocuous than this. If people are to spend the rest of a lifetime together, it would seem that three days more or less at the start would not be vital. *It is interesting, therefore, to see the havoc that the law has wrought in every state in which it has been adopted.* Frequently it has committed the unpardonable sin—it has “hurt business,” and has been repealed at the next session of the leg-

islature under the onslaught of those whose pocketbooks were adversely affected: hotel proprietors, florists, jewelers, firms that take the first payment on furniture, and justices of the peace for whom every marriage that did not take place meant the loss of \$5.

In Los Angeles County alone, to take only one illustration, more than a thousand couples each year go to the courthouse and apply for a license to wed, and then do not take the trouble to come back three days later and get it. What happened to those abandoned romances would make an interesting investigation. While the facts often can not be obtained, indications suggest that a large proportion of them represent freak marriages, fraudulent marriages, drunken marriages, runaway marriages, and others whose consummation could have been of no value to society. Under the old system whereby the couple got a license at once, walked across the hall of the courthouse, and were married forthwith, there would have been that many more marriages to end in divorce or annulment proceedings after a few weeks or months or years, perhaps with children to complicate the situation. It is difficult to believe that any prospective marriage which has so little viability as to be destroyed by 72 hours delay would have had sufficient viability to endure for a lifetime afterward. The requirement of advance notice, that leads to the abandonment of many marriages in which sexual selection was bad, is one of the most practical eugenic measures, injuring no legitimate interest but protecting individuals and the state alike.

Eventually a longer delay would probably be useful. Meanwhile one might look forward to an amendment which would make the delay 48 hours from the time of publication of the notice of intention to wed, in the legal papers of the county of residence of each applicant. This would give better facilities for bringing to light important information, such as facts concerning infectious disease, previous marriage, misrepresentation of age, and the like. To avoid evasion by marriage out of the state, every state should adopt a law requiring advance

notice, and the terms of these should not vary so widely as to make a few states particularly attractive to those desiring to avoid reasonable precaution.

3. A physical examination before marriage has often been urged as desirable, and some American states have adopted such a provision, nearly always applying only to the male, however. This, although sometimes spoken of as a "eugenic law," is eugenic only in a very indirect way, if at all; it is a hygienic measure in most instances, particularly intended to prevent the marriage of persons infected with a venereal disease. As such, it is a step in the right direction, but it should not be advocated primarily as eugenic.

Any proposal for a premarital examination involves many difficult practical problems. How, when, and where is it to be given? Who is to pay for it, and what is it to cost? If the examiner finds a condition which he thinks unfavorable, is this to be ground for refusal of the state to issue a marriage license, as is oftentimes urged? Or as some French writers hold, is it sufficient that the findings should be communicated to the other party on the ground that he or she must have the right to make the final decision, but should not be required to do so blindfolded? Finally, what is to be the scope of the examination: should it be limited only to venereal diseases, or include other infectious diseases such as tuberculosis, or also mental diseases or mental defect; should it take account of ancestry as well as of the candidate and finally, in how many jurisdictions of the United States are there qualified medical men and other specialists to assume the responsibility of giving a satisfactory examination?

So far as venereal disease is concerned a serological examination for the presence of syphilis is essential, and this should be made either by an official board of health or in a laboratory supervised by the state.

Whatever is done should in principle apply alike to the two sexes. Meanwhile, any step in this direction has at least educational value in calling attention to the need for a clean bill



of health before entering on marriage. It is probable that eventually marriage will not be permitted without a thorough examination as to physical and mental disabilities and that in certain cases a marriage license will be issued only after evidence that one or other of the applicants has been sterilized.

In the meanwhile, voluntary examination on the part of intelligent and socially-minded persons is desirable. If this becomes widespread, anyone who proposes marriage without presenting evidence of fitness will come to be looked upon with suspicion. If the premarital examination also furnishes opportunity for making up the candidate's deficiencies in sex education, successful marriage will be promoted, with a higher probability of adequate reproduction, and the eugenic value of such marriages will be enhanced.

Apart from venereal disease, which is more frequent among men than among women in most parts of the community, a general premarital examination is more frequently found to be of direct value to women than to men. It aids in removing emotional blocks to successful adjustment, likewise those due to mere ignorance, and helps to uncover occasional possible sources of difficulty which, if known in advance, can often be avoided. Among these are sterility due to infantilism, structural defects such as narrow pelvis which might make child-bearing difficult, and many factors which might make for sexual maladjustment.

In order to provide standardized facilities for premarital examinations, Prussia has established bureaus (*Eheberatungsstellen*) in every city, and many other European governments have done the same, while a few others have been established by private agencies. The first of these was due to the initiative of the Department of Health in Vienna, Austria, in 1922. It was so successful that 10 years later there were said to be nearly 300 such in various cities of the Continent; most of them officially organized and supported by public funds.

Specific provision for premarital examination has been slow

to appear in the United States. The most important step in this direction was perhaps the establishment of the Institute of Family Relations in Los Angeles, Calif., at the beginning of 1930. The "premarital conference" given here includes a study of the personal and family history, tests as to temperamental adaptability, physical examination, and an educational preparation which is particularly thorough. It is emphasized that the purpose of this is not to tell people whether they should or should not marry. Assuming that they have decided to marry, its purpose is to enable them to make success in marriage as certain as possible. Its eugenic value is therefore largely indirect, though none the less real.

4. Every state prohibits the marriage of an insane person because such a person is legally incapable of entering into a contract. Every state also prohibits the marriage of an idiot or imbecile if found similarly to be incapable of entering into a civil contract. In practice, however, these general provisions and the statutes especially made to extend them are of little value in the prevention of unwise mating, because there is no provision for ascertaining the actual status of people who apply for marriage license. Even if the license clerk asked each of them solemnly as he does in Pennsylvania, "Are you an idiot or feeble-minded?", he could not depend on getting accurate information, since the candidate might be prejudiced in his own favor. Legal commitment to a state hospital for mental diseases or to a state institution for mental defectives might, if the fact were known, be ground for refusing a marriage license. In such cases, it often happens that the parties go into an adjoining county or state, where they are not known, and there have no difficulty in marrying. Some states have established official registers of persons who, because of such record, are not eligible to get marriage licenses. This, however, does not necessarily prevent them from leaving offspring.

5. One-third of the United States forbid the marriage of first cousins, Oklahoma even extending the ban to second cousins. This is often defended on the ground that cousin mar-

riages tend to result in defective offspring more frequently than do those in which relationship is remote.

Biologically, the effect of cousin marriage or of inbreeding in any other degree is to bring together similar lines of ancestry. This may unite recessive genes, which when separated produced no visible effect, but when united will be the cause of abnormal development. In this way a child who is congenitally deaf, or mentally deficient, or otherwise handicapped is sometimes born to cousins who seemed to be free from such handicap; and consanguinity is blamed. The blame is not well placed, for the same result would have occurred if two persons not related by blood but each carrying the same recessive gene had married.

Instances in which a cousin marriage has given rise to defective children can be matched easily with other instances in which cousin marriage has given rise to sound children. The marriage of Charles Darwin with his first cousin Emma Wedgwood is a stock illustration, because of their four distinguished sons.

Still more striking are the cases of long-continued close breeding,<sup>116</sup> as in the 18th dynasty of ancient Egypt, when brother-sister marriages were continued almost without a break for nine generations, yet with no evidence of undesirable effects. The Ptolemies, Greek rulers who took over the government of Egypt a thousand years later, adopted this same practice, and the celebrated Cleopatra who figures in the history of Julius Caesar and Mark Antony was the offspring of six generations of brother-sister marriage. Among the Incas of Peru, destroyed by Pizarro at the conquest of that kingdom, the ruler was said to be the descendant of several generations of brother-sister marriage.

Such rare cases in human history can be matched more easily in live-stock breeding, and particularly from the experiments carried on during recent years to test the effects of inbreeding, in which 50 or 100 generations of animals have been produced by brother-sister matings. These have shown clearly that the question of inbreeding is a question of the kind of

material that goes into the inbreeding. If the parents carry defects, the offspring get a double dose of them and therefore may be inferior to their parents. If the parents carry strong qualities, the offspring likewise get a double dose of them, and therefore may be superior to their parents.

Consanguineous marriage often indicates a lack of normal social contacts and adequate range of choice, and it is desirable that one's choice should not be confined to his own relatives. But if one wants to marry a cousin, the question to be decided is essentially the same as in any other case. It is not a question of whether they are cousins but whether they both are of sound ancestry.

The frequency of consanguineous marriage has always varied in different parts of the population, being greatest in strata where there was a high social selection or a tendency to arrange family marriages to keep estates together, as in aristocracies, and likewise in France where the estate of a father is divided among all his children. Consanguineous marriage is also common in groups that are shut off by barriers, either geographic as the Jukes in their isolated mountain valleys, or social, as the ghetto Jews, or religious, as the Parsis of India. Cousin marriages are steadily becoming rarer, not merely because people travel about more than they used to and therefore are not so likely to be brought up in close contact with their relatives, but mainly no doubt because cousins themselves are becoming rarer. A century ago it was not an uncommon thing for a man or woman to have 50 or even 100 first cousins. Nowadays in the educated part of the population few young people have as many as 10 first cousins. Merely on a chance calculation, therefore, the earlier generation was five or ten times as likely to marry a cousin, as is the present.

Laws prohibiting cousin marriage, although common, are not scientifically well based. They are not needed, and should be removed from the statute books.

6. Nearly half of the United States still retains the provision of the old English common law (abandoned by England

herself in 1753) which permits a so-called common-law marriage without licenses and without official celebration.

In such states, if two persons, not otherwise disqualified for marriage agree to live together as man and wife and do so live together, they are legally married. This may have been a useful measure on the frontier in early days, when there were no organized counties to issue licenses and only distant ministers to officiate at marriage ceremonies. It has long outlived any usefulness it once may have had. It now lends itself mainly to anti-social purposes, and it leaves a fatal loophole in any attempts to restrict marriage for eugenical or other reasons. The common-law marriage should be abolished in every state <sup>118</sup>

In addition to such measures as the foregoing, which are to determine who may marry, the state has also the power of deciding who may be released from marriage. This, like the first prerogative, is subject in practice to serious limitation. Just as denial of a marriage license may not prevent two people from living together, so denial of a divorce may not prevent two people from living separately. In any discussion of marriage and divorce legislation, it is necessary to bear in mind the fact that the legal theories do not correspond exactly with the biological realities. Nevertheless, there is enough correspondence so that divorce legislation is a matter of eugenic importance

The number of divorces has increased year by year for four or five decades. But so has the number of marriages. There is perhaps no familiar subject on which misconceptions, based on statistical fallacies, are so widely current as on this <sup>25</sup> Such is the statement that whereas a generation ago there was one divorce for every 20 marriages, now there is one divorce for every five or six. It is an easy matter to calculate that it will not be long before there is a divorce for every marriage, and if the trend continues, why should there not be thereafter two or three divorces for every marriage, at a time not too remote?

This type of statistical difficulty, growing out of the rapid change in ratio between two numbers that do not start at the

same point, has bothered many a child. Suppose he is born when his father is 30 years old; then the ratio of his age to that of his father is  $1 : 30$ . A decade passes; son is 10 and father 40. The ratio is no longer  $1 : 30$  but  $1 : 4$ . What an astonishing gain the son has made on the father in a mere decade! In two decades more the offspring is 30, the parent 60. While the former at birth was only one-thirtieth as old as his parent, he is now half as old as his parent. Obviously, at the rate he is going, it will not be long before he is as old as his father, and thereafter if he lives he will gradually leave the old man behind.

When the illustration is thus taken from a familiar source, the fallacy is easily recognized, and it is seen that the ratio in this case is not the proper source of information but that one should study the differential instead. This is 30 years at the child's birth, and it will not have changed a century later, if the two should live so long. The father will never be more nor less than 30 years older than the son.

The problem of the divorce ratio is essentially the same.\* Instead of asking how the ratio is changing—an inquiry that means little—one should ask whether the differential has changed. When this is done, it transpires that although the number of divorces has been increasing year by year, the number of marriages has also been increasing year by year, and that the differential has undergone surprisingly little change. In other words, there are more unhappy marriages, ending in divorce, than there were a generation ago; but there are also more happy marriages which do not end in divorce. Of all

\*It is not entirely simple, since the remarriages of some divorced persons introduce a disturbing element. Moreover, the number of divorces should not be contrasted with the number of marriages in the same year, as is usually done, since divorce usually follows only some years after marriage (oftenest after two or three years, but continuing in large numbers until at least 10 years after marriage). The divorce rate might better be compared with the marriage rate say five years previously. Again, some homes are broken by death before divorce has a chance to intervene. On the whole, the number of broken homes, in proportion to the population, has not changed during the last generation, because some increase in the number broken by divorce has been offset by some decrease in the number broken by death (the increased expectation of life for those not yet middle-aged). But the discussion in the text refers to homes broken by divorce, not to all broken homes.

marriages, the proportion that proves to be happy has not changed greatly in the past generation.

Moreover, the broken homes do not occur at random in the community, and the idea that "one marriage out of every five ends in the divorce court" is thus again misinterpreted. This error is reminiscent of that made by the mother of four children, who refused to bear a fifth. When asked why, she explained that she had heard "every fifth child born in the world is Chinese"; and that she did not think a Chinese child would get along well with the four she had.

Even if it is true that one marriage in every five ends in divorce, it does not mean that every marriage is equally likely to be this one. Observation shows that the broken homes are found more frequently in certain strata in the population, less frequently in others. These strata overlap to some extent, but the part of the population that is making use of the divorce courts is found to differ in some important ways from the rest

1. The divorcees show a much higher frequency of mental disease than does the whole population. The psychopathic hospitals are heavily overloaded with divorced persons, and the same situation is found among psychiatric patients, who have not been committed as "insane" but have yet found it necessary to consult a specialist in mental and nervous diseases.<sup>123</sup>

That a mentally diseased person is hard to live with, is no cause for surprise. Beyond this, to seek the help of the divorce court is in itself reminiscent of mental disease. If one adopts the point of view of a large school of psychiatrists, that mental disease is in many instances essentially an attempt to escape from actuality, then the parallel with divorce is striking, since divorce is in most cases not a solution of domestic problem, but merely a running away from it. Indeed the problem often goes along with the man or woman, since it is inside him or her. Without attempting to press too far this parallel between escape into mental disease and escape into a divorce court, one may yet feel that the resemblance exists.

2. The divorcees comprise more than their share of the very rich and the very poor. In the first case there is perhaps too much interest outside the home; in the second not enough. In both cases there is no economic bond to keep the family together. The rich can afford to live separately, while if the poor are supported by the county charities, it makes no difference to them whether they get their grocery orders at the same address or on opposite sides of the street. They get along just as well in either case.

3. The divorcees consist to a surprisingly large extent of people whom one might call "just naturally delinquent." They can not adjust themselves to the obligations that society puts on adults, in respect to marriage any more than in respect to good citizenship. A study of all the divorce cases filed in Minneapolis in one year<sup>118</sup> revealed not only that nearly half of the petitioners were clients of some charitable agency (compare ¶2 above) but that a large part of them had previous court records. One couple had appeared in every court in the city a total of 28 times before they struck the divorce court in their rounds; another had 21 court appearances to its credit; and so on. Evidently this group would overlap widely with the group of mentally diseased.

4. The divorcees consist largely of people who have no active religious affiliation. Church membership is correlated with social and educational status, conservatism, and so on, so that the bearing of this fact is not simple. The fact that the southern United States have a relatively high divorce rate might seem to contradict this, since they are supposed to be the part of the Union in which religion is most widely and actively practiced. Their high frequency of divorce is probably due to the fact that they contain so few Roman Catholics and foreign-born, both of which groups have low divorce rates. The high rate of the southern states is doubtless much lower than would be the rate of the native whites alone in many northern states. Negroes in some studies have also shown high divorce rates.



5. The divorcees show to an unusual extent wide differences, whether in age, in race, in culture, in education, in wealth, in religion—anything that serves as a cause of disharmony and creates a lack of unity from the outset.

6. The divorcees have in an unusually large percentage of cases married either very young (this group contains the forced marriages, the unstable, those rebellious against parental authority, and so on) or they have married older than the average, which often goes with biological inferiority.<sup>17</sup>

7. The divorcees are infertile to a striking degree—or at any rate they are low in fecundity.<sup>18</sup> Five-sixths of all the divorces come from the minority of American married couples having no child or only one. So important is the effect of the presence of children that the chances of divorce to a couple without children are calculated to be nine times as great as those to a couple that has any children at all. (This again, it must be emphasized, is purely a statistical conclusion and does not relate to every family equally.) Of childless homes under present conditions 71% end in divorce, while only 8% of the homes with children are broken by divorce. Of course, no one can say how much of this childlessness is purely voluntary, but in any event it probably points to the presence of a greater than average lack of some biologically desirable, germinal traits, whether these be physiological or psychological.

The picture that emerges, then, of the part of the population that gets divorces is that of an unstable, irresponsible, irreligious, childless group, unable to adjust itself successfully to any sort of an adult situation, ill-mated, not at all representative of the great bulk of the normal population.

Not all the divorcees are of this type, of course. Some are more or less innocent victims of ignorance, or of social conditions. Presumably it would be this relatively normal component of the divorcing population that would tend to remarry, while the more abnormal type would not. As a fact, about 35% of the divorcees seem to remarry.<sup>19</sup> These appear to be just

about as happy in their second marriages as the rest of the population does in its first and unique marriages.

Subject to innumerable individual exceptions, then, it may be said in a general way that one-third of the divorcees are good material that is salvaged, the other two-thirds are inferior material that is discarded from the process of evolution. Of this two-thirds many are biologically inferior and their elimination from the married population of the United States is desirable or inevitable, as the case may be.

This does not mean that divorce is not often abused. But some such provision is needed to remedy the effects of dysgenic mating, and to allow the minority of fit persons who emerge from the divorce courts to remarry. The majority of the unfit are thus eliminated from reproduction. Without such an elimination the race would probably have a greater production of inferior children than it has now, and a lower production of superior children.

Much more attention, then, should be paid to promoting successful marriage, and less time wasted on debating "the divorce evil." If a home is broken, the exact legal form in which this fact is recorded is of secondary importance. All reasonable restrictions should be maintained to prevent frivolous actions, since too easy divorce laws breed needless divorces, such as seem to result from the system of divorce by mere registration that is in effect in Soviet Russia. The time for society to intervene is, first, to enforce caution before the marriage takes place, and second, afterward to give the couple every possible help in making a success of marriage. If a fit person finds that he or she is tied to an unfit one, society is the gainer by loosing this tie and allowing the fit one to remarry. More social stigma should be attached to the evil of mismating than to the undoing of such an unfortunate marriage.

From this point of view the time-honored justifiable grounds for divorce—adultery, impotence, venereal infection, desertion, non-support, habitual cruelty—appear no more worthy of recognition than the more nearly dysgenic grounds of chronic

inebriety, mental deficiency, mental disease, or any other serious, inheritable, physical, mental, or moral defect.

The present legal procedure in divorce hearings is not adapted to its purpose. The domestic relations court might well be modeled more nearly on the plan of the juvenile court, with specialists in natural and social science to act as investigators and the judge mainly to give legal effect to their findings. Experience shows that many broken homes could be prevented, even at so late a stage in the proceedings as is represented by appearance in court, if skilled help were available to eliminate minor causes of friction in marriage.

It is doubtful whether any gain would result from a uniform federal divorce law, any more than from a uniform federal marriage law already discussed. Such legislation would represent a compromise between the standards of the several states, a sort of lowest common denominator in which some states would raise their standards, others would lower theirs. It would destroy what is one of the chief virtues of the American form of government—the opportunity to experiment in separate states and thus make social progress which is much slower in a rigid, highly centralized government.

But with the present frequency of travel, it is desirable that there be an interstate comity, so that divorces granted in one state will be recognized in another, and that international treaties be arranged to the same effect. Nothing is gained by the present system under which a person may be a married man in one jurisdiction, and at the same time an unmarried man (or perhaps a bigamist) in another.

But in any event, as we have indicated, we are less concerned about divorce legislation, since the real evil has usually been done before the couple reaches the divorce court. If there could be a transfer of emphasis for 10 years from discussion of divorce to methods for making marriage more successful, the nation would probably be the gainer.

In addition to the social, economic, and educational measures outlined elsewhere in this book, and the few legal meas-

ures discussed earlier in this chapter, there is a real need for community facilities which will aid people who are having difficulties in marriage to rectify them, instead of merely running away from them by resorting to the divorce court. The European family counsel bureaus previously mentioned help to meet this need, in most cases, and many such services are offered in the United States in yearly increasing numbers through physicians, ministers, psychologists, and educators. The most comprehensive plan is that worked out by the Institute of Family Relations in Los Angeles which attempts to focus all the resources of science on such a problem, not of course with the idea that it can solve all problems, but with the idea that it can give help to many. Its staff of consultants comprises home economists, psychologists, and biologists, as well as medical specialists, and it reports that where an intelligent couple want to cooperate in working out their problems, it can usually enable them to do so. During the first three years of existence it had more than 5,000 clients.

While it found an unlimited number of variable factors in the cases of marital disharmony presented to it, three were reported always present: a sexual maladjustment (frequently not known to the couple until pointed out to them, but none the less a cause of friction), an economic maladjustment due to lack of education for home-making or handling family finances, and a failure to use leisure time in ways that are mutual, wholesome, constructive, inexpensive, and tending to build up family solidarity. Since all of these are matters of education, it is evident that the percentage of broken homes could be reduced materially by better education for marriage and parenthood and, even after marriage and after difficulties have arisen, by the provision of a counseling service to aid in eliminating them. At present it seems evident that the conservation of the family will be promoted much more by directing effort along these lines, than by any possible revision of divorce laws.

## CHAPTER XII

### EUGENIC ASPECTS OF WAR

War always changes the composition of a nation. From the eugenic standpoint this change consists of both losses and gains, and the net result may be a gain or a loss. The eugenic effects of war occur during three periods:

1. The period of preparation
2. The period of actual fighting.
3. The period of readjustment after the war.

The first division involves the effect of a standing army which withdraws men from civilian life during a part of the reproductive period and delays their marriage. If the period of service is long and if the army is a specially selected group as is usual this effect is undoubtedly harmful. If the period of service is short, it is argued that army service to the nation as a whole may be less harmful eugenically than a college education; that it permits better choice of a mate after expiration of the term of service, and that by promoting good health, habits of industry and discipline and the like, it may make for more efficient parenthood.<sup>46</sup> In a few armies this may be so, but in others health and habits are impaired.

The dysgenic effects are more evident in the class of officers, who usually serve for life and who average superior because of the high scholastic standards at the army colleges. Owing to social standards which members of this group feel they must keep up, they usually marry late if at all, and severely limit the size of their families. Measures to encourage earlier marriages among them are desirable. Correspondingly undesirable is such an order as that issued in June, 1932, by the then Secretary of the Navy, Charles Francis Adams, under the terms of which naval cadets were forbidden to marry until at least two

years after graduation. Because of the nature of their work, this distinctly superior group already has a low fecundity. To compel postponement of marriage in some cases for at least two years is eugenically a backward step.

In almost every known case the maintenance of a standing army has involved a high incidence of venereal diseases, and the spread of these to the civilian population. The resulting sterility and infant mortality is probably one of the most serious effects. Venereal diseases are of course not a necessary concomitant of a military establishment, and in the American army since the beginning of the World War these diseases have been greatly reduced, although a serious problem.

In countries such as Great Britain and the United States, prior to the World War, standing armies were small, were made up of volunteers, and probably attracted among others, a group of less than average eugenic value, men a considerable portion of whom were nomadic, unstable, and not well adjusted to everyday life. Under these conditions the army probably served as a means of eliminating from the race some elements that were not well adapted to progressive civilization. The main eugenic loss was therefore at that time from the officer class.

At the present time the conscript armies of most European states on the whole represent a cross section of the population, excluding the physically and mentally unfit, and because these are eliminated, the army represents a group above the average. As a consequence the conscript army system in itself is dysgenic.

Without extended discussion, the following considerations are suggested to govern a policy of military preparedness that will safeguard eugenic interests as far as possible:

(a) If the army is a standing one, composed of volunteers serving long terms of enlistment, they should be of as advanced an age as is compatible with military efficiency. If a man of 36 has not married, he is not likely to do so, and is probably eugenically inferior. There is little or no loss to the race in enrolling him for military service. The case is quite different with a youth from 18 to 25

(b) Unless composed of inferior men, the army should not foster celibacy. Short enlistments are the most valuable means of avoiding this evil. It has often been found possible to provide homes for the non-commissioned officers, and to encourage their marriage, even when this could not be done for the rank and file.

(c) Officers' families should be given an additional allowance of pay for every child. This would aid in increasing the birth-rate, which appears to be very low among army and navy officers in the United States, and probably in all civilized countries.

(d) If a large army is required, universal conscription is much better than voluntary service, because less selective. Those in regular attendance in college should receive their military training in their course, as was done in the United States during the World War. This applies only to a period when universal conscription is being enforced, and is not an argument in favor of compulsory military training in colleges at other times.

(e) Every citizen is called upon for service to his country in time of great need, but this service should be what he can best perform. *It is a serious error of judgment to send to the front the highly trained technical men of the nation.* England, especially, made this mistake during the World War, as did other countries in various degrees. Since modern wars are won at home quite as much as on the firing line, specialists should be used at home, and not as shock troops.

From these points of view, it is still worth while to consider how far the creation of the National Army in the United States, 1917-1918, was eugenically ill-planned:

(a) Too many college men and men in intellectual pursuits were taken as officers, particularly in aviation. Many lacked the necessary qualification of leadership, and might have been replaced by men who had demonstrated the necessary qualifications, as foremen and others accustomed to boss large gangs.

(b) In some districts the burden was thrown too heavily on the native citizens, through the necessary exemption of aliens. There were communities in New England which actually could not fill their quotas, even by taking every acceptable native-born resident, so large was their alien population. The quota should have been adjusted to meet this condition.

(c) The spirit of the selective draft was widely violated in calling up the first quota, by refusal of district boards to exempt men who were much more valuable at home than in the trenches. Only a thorough public education on this point will suffice to stem the tide of public opinion that rises against supposed draft evaders, once the nation is at war.

On the whole, however, the creation of the National Army was conducted admirably, and marked an immense improvement over anything previously known in countries that did not have compulsory military service during peace times.

2. Leaving the period of preparedness, we consider the period of open warfare. Since war is, from the present point of view, a factor in natural selection, it is necessary to consider it under the three heads of (a) lethal selection, which operates through differential mortality, (b) sexual selection, which operates through differential mating, and (c) fecundal selection, which operates through differential rates of reproduction. Moreover, selection operates both in an intergroup competition and an intragroup competition. The influence of any agency on natural selection must be examined under each of these six heads, if its eugenic effect is to be understood.

(a) Considering lethal selection in its intergroup aspect, one must compare the relative quality of the two groups involved, and ask which is likely to make the greatest contribution to progressive evolution, and is therefore most worthy of conservation.

The evidence for believing in substantial differences between races is based (a) upon their relative achievement when each is isolated, (b) upon their relative rank when the two are competing in one society, (c) upon the relative number of original



contributions to civilization which each has made, and (d) upon specific statistical studies of traits where the environmental factor can be minimized. Such comparisons are fatal to the sentimental equalitarianism that denies race differences. While there is, of course, a great deal of overlapping of the range of variation, there are nevertheless real average differences. To think otherwise is to discard evolution and to revert to the older standpoint of "special creation," since the different races have been exposed to differing environments for very long periods of time.

Comparison of the quality of the contesting armies is sometimes, of course, very difficult. One may feel little hesitation in arriving at a decision in the wars of the Egyptians, during their early history, with the Upper Nile tribes, but in regard to the Franco-Prussian War, the Russo-Japanese War, the Boer War, or the American Civil War, not enough is known to warrant a judgment of the relative germinal values of the armies involved.

On the species as a whole, the eugenic effect of war is very different according as the sides differ much or little, and according to the proportional losses of the two sides. On the one hand is that type of war in which a race advanced in organization, discipline, and type of weapon exterminates a tribe with which it wars. An almost contemporary illustration is the annihilation in 1898 of the "dervishes" of the Sudan by General Kitchener's machine guns. Probably in many such cases the conquerors were superior germinally, but of course in others equal, while in a few cases those exterminated may have been superior.

A second type of war is that in which only the warriors of the defeated group were put to death, while the women and children were spared, and incorporated into the conquering community. This policy increased the variability of the victorious tribe and changed its germinal nature, sometimes for the better, sometimes for the worse.

In a third type of military victory in ancient times there

was no resultant social mixture, but an economic exploitation of the victims instead. If the survival rate of the conquered was diminished as compared with that of the conquerors, the result was like that following extermination, except in a less extreme degree.

But between nations of somewhat equal standing, victory is determined less by the innate qualities of single nations, than by their success in making powerful alliances. These alignments are by no means always associated with better innate qualities, because (i) there is a natural tendency for a number of weak nations to unite against a strong one, (ii) there is a tendency for secondary groups to side with the principal who seems to be winning, and (iii) political and military alliances are frequently results of the chance happening that one of a series of leaders is in power at the critical time. In recent history there is a separation of only four years between the bellicose Theodore Roosevelt and the idealistic Woodrow Wilson. In Russia only eight months intervened between the rule of Nicholas Romanoff and that of N. Lenin. In either of these instances, a difference of a few years might have meant quite a different alignment.

Modern European wars, especially the latest, have been marked by a high quality of the combatants on both sides, as compared with the rest of the world. As these same races fight with pertinacity, there is a correspondingly high mortality rate, so that the dysgenic results of such wars are particularly devastating. The lowest careful calculation<sup>101</sup> of the losses of mobilized men in the World War put them at 11,000,000 (of whom 8,000,000 died from wounds, 3,000,000 from disease), and other conservative calculations<sup>102</sup> have made the total at least 2,000,000 higher.

As for the selection taking place *within* each of the struggling nations, the combatants and the non-combatants of the same age and sex must first be compared. The difference here depends largely on how the army in question was raised.

Where the army is a permanent, paid force, it probably does

not represent a quality above the average of the nation except physically, and (in some important respects) as pointed out above, it may be even a good deal below the average of citizenship.

When the army is conscripted, it is superior physically and probably slightly superior in other respects, since mental defectives are rejected, though not to the same extent as physical defectives.

If it is a volunteer army, its quality depends largely on whether the cause being fought for is one that appeals mainly to the spirit of adventure, or one that appeals to high moral principle. In the latter case, the cause may win those with an unusual amount of idealism and altruism, and their loss may be peculiarly damaging to the race. Unfortunately this situation is common, since by skillful diplomacy, journalism, and emotional appeals to mob psychology, a cause which is a veritable exploitation, an adventure, or a political move, may be presented to the public in the light of a great moral crusade. Many historians consider this was the case when the United States declared war on Spain in 1898.

In other instances, as was perhaps the case of the war of Great Britain with the Boers, a volunteer army is largely made up of adventurous, nomadic, unadjusted elements without many home ties, elements which can hardly be rated above, or even as high as, the racial average. Its loss may even purge the race of certain elements that do not conform to the peaceful and productive cooperation of daily life.

Unquestionably the greatest racial damage occurs in such wars as those waged by great European nations, where the whole able-bodied male population is called out. Only those are left at home who are unfit to fight, but who are not, so it would appear, considered unfit to perpetuate the race.

Even within the army of one side, lethal selection is always operative. Those who are killed are not a random sample of the whole army. There is a disproportionate representation of those with (i) dauntless bravery, (ii) recklessness, and (iii)

stupidity. The two groups last named represent less serious eugenic loss than the first. But, as an increasing part in war is played by artillery, mines, bombs, and gases, the chance of being killed becomes less and less selective.

It has generally been the case that officers suffered a heavier proportionate mortality than enlisted men. Since the officers are selected from the part of the population that would in peace time furnish much of the nation's leadership, this is a particularly serious dysgenic effect. In the Franco-Prussian War, the loss in the Prussian army is given <sup>132</sup> as follows:

Generals	46 per 1,000
Staff officers.	105 " "
Field officers	88 " "
Non-commissioned officers and enlisted men	45 " "

But in the latest conflict, changed conditions of warfare seem to have decreased this difference in some of the armies. Of 410,000 officers of all sorts in the German army, 13.8% died; of 13,000,000 men in the ranks (including non-coms) 13.0% died.<sup>132</sup> A similar situation was found by Harrison Hunt in the casualties of the American army.<sup>78</sup> This is probably a result of the military technique of modern war which, for its own purpose, has restrained the romantic and unnecessary risking of life that was conspicuous, for instance, among British officers in the early months of the war. However, in the World War Professor Hunt also found that Harvard alumni, a selected group, had a higher mortality than that of the whole male population of comparable age.

Even if death in battle were more discriminative than it is, one could only say that in general it took the poorer out of the better, but still they are the better. The others are left at home. Thus of 287,000 drafted men with defects, 83% were rejected from the U. S. army. Only 17% were accepted, and of these not all were exposed to the risk of battle. Many were given protected or non-combatant occupations. The nature of some of the changes thus produced in the population of the

United States may be inferred from the ratio of rejected to accepted men who presented some of the more important defects:

Insanity	141 : 1
Epilepsy	118 : 1
Deafness	103 : 1
Mental defect	56 : 1
Tuberculosis	55 : 1
Cancers and tumors	2 : 1

Thus the effect of the draft, if some of the rejected men stayed at home and had children while some of those accepted were killed and left no children, was to increase the proportion, in the American people, of insanity, epilepsy, tuberculosis, and so on. And the 118,279 men who died in the American army during the World War subtracted a disproportionate amount from the sound racial stocks of the nation <sup>76</sup>

The same argument, that even with the most favorable showing, wars tend to destroy the poorer out of the better, applies to death from disease. In most wars in the past such deaths have outnumbered casualties on the field of battle. Varying degrees of resistance to infection, and varying knowledge and appreciation of the need of hygienic living, play a part here, but decreasingly as discipline and organized sanitation advance.

The proportion of the population that each side sends to the front, if the combatants are either above or below the average of the population, is significant. A nation that sends all of its able-bodied males forward is biologically affected in a different degree than is its enemy that has needed to call on only one-half or one-tenth of its able-bodied males in order to win its cause.

Back of the fighting lines of the contending sides, conditions that prevail are rendered more severe in many ways than in times of peace. Poverty may become rife, sanitation and medical treatment of the civilian population may be sacrificed under the strain. The scourge of typhus in Serbia during the World War is an illustration. The world-wide influenza pan-

demic, for spread of which the war is commonly held to be largely responsible, is another instance.

On the other hand, civilized nations have profited by past experience to make extra efforts during war for the protection of mothers and children, for infant welfare, and for birth assistance. It would take a catastrophic condition (which might well be experienced in another World War), to duplicate conditions of the older past, as when the population of Germany during the Thirty Years' War decreased to one-half or perhaps only one-third of its former figures.

(b) Turning now to a consideration of sexual selection as between the warring groups, one notes little effect in modern times, though in the past this was an important factor when the enemy's women were assaulted by invaders or, as is recorded of the ancient Hebrews, when the enemy males were killed and their women taken home by the conquerors.

Within the group, mating at the outset of the war is increased by many hurried marriages. There is also, in some cases, an increase in illegitimacy in the neighborhood of training camps. In each of these instances, such matings do not represent as much maturity of judgment as there would have been in time of peace, and hence they furnish evidence of a less desirable sexual selection.

(c) Fecundal selection is most in evidence in the drop in the birth-rate, due to the absence from home of men between the ages of 18 and 45. Since many of these men do not come back, the loss of their reproductive contribution is permanent, and it has already been emphasized that they are above the average of the population.

In calculating the demographic effects of war, the loss in potential population, so to speak, has thus to be taken into account. When this source of loss is added to the losses in battle and the losses from disease, it has been calculated that the World War actually cost 30,000,000 lives. The bulk of this loss fell on the most highly civilized nations of the world, those that were capable of making the greatest contributions to hu-

man progress, had they directed their energies more constructively. It seems evident then that at no period in the known history of mankind has the innate quality of the human race deteriorated so much in four years, as it did in the period of 1914-1918.

3. After a war is finished, much of the cost remains to be paid

(a) Lethal selection between groups is affected by the relative impoverishment of countries, sometimes by the deliberate crushing of the vanquished by the victor, through spoliation or heavy tribute

Lethal selection within the group is affected by social and economic conditions, by the spread of infectious diseases with returning soldiers (in the past, the venereal diseases after war have repeatedly wrought havoc).

(b) Sexual selection between groups at the conclusion of a war is now a minor factor, but that within a group is a desirable subject for study. Due to the loss of many superior men of marriageable age, some women of the corresponding age, and especially of corresponding superiority, must remain unmarried. The selection of women, ordinarily more stringent than that of men, is therefore intensified. In other words, men are at a premium, so that it is easier than ever for nearly any man to marry, no matter how great his handicaps. Women, on the other hand, are at more of a discount than ever. Theoretically this might result in a more careful selection of wives that would help to offset the impaired quality of husbands. Whether it does or not is a question still waiting answer on the basis of research.

The effect of a shortage of males is said to have been experienced in an acute form in Europe after the Thirty Years' War. It has been felt in all the belligerent nations since the World War, and the distress thus caused is only now beginning to disappear, as the generation of women that had to remain unmated because of the loss of men is passing the usual age of marriage. The five years war of Paraguay with Brazil, Uru-

guay, and Argentina (1864-1869) is perhaps the most glaring case on record <sup>87</sup> in recent years of the destruction of the male population of a country. Whole regiments were made up of boys of 16 or less. At the beginning of the war the population of Paraguay had been given as 1,337,437. It fell to 221,079 (28,746 men, 106,254 women, 86,079 children). It is even now probably not more than half of the estimate made at the beginning of the war. "Here in a small area has occurred a drastic case of racial ravage without parallel since the time of the Thirty Years' War." Macedonia, however, furnishes a fairly close parallel. David Starr Jordan found whole villages there in 1913 in which not a single man remained; only women and children. Conditions were not so very much better in parts of the South at the close of the Civil War, particularly in Virginia and North Carolina, where probably 40% of the young men of reproductive age died without issue. And in a few of the northern states, such as Vermont, Connecticut, and Massachusetts, the loss was proportionately almost as great. These were probably as good men as any country has produced, and their loss, with that of their potential offspring, undoubtedly is causing more far-reaching effects in the subsequent history of the United States than has ever been realized.

(c) Turning to fecundal selection, one of the principal effects appears in the decreased earning power of many of the wounded, which varies with the proportion killed in battle and the efficiency of the medical department. The main one however is from the heavy burden of taxation that normally follows, a burden which is sometimes made catastrophic by the depreciation of currency, as in many European countries after 1919. The net cost to the United States government, of its participation in the World War, was estimated by the Secretary of the Treasury, in his annual report for 1928, to be \$35,119,622,144.00. To this must be added sums that are immense in the aggregate, represented by the loss of earnings and sometimes of earning power by those who participated. The cost of caring for the disabled, and sometimes the cost of bounties



to the able-bodied whose organized political power uses "patriotism" as a cloak for raiding the public treasury throughout the rest of their and their children's lives, increases immeasurably the burdens of the remainder of the population. Since the difficulties of raising a family are so largely economic anyway, as is shown in many parts of this book, the economic difficulties resulting from a first-class war may in the long run be racially quite as disastrous as loss on the field. The latter loss is concentrated in a few years; the former continues insidiously for a generation or more. Indeed the United States is still paying pensions not merely for the Civil War, but for the war with Mexico and other campaigns of nearly a century ago.

To sum up, there are so many features of natural selection, each of which must be weighed separately and the whole then balanced, that it is a matter of extensive inquiry (much of which has not yet been made) to determine whether war in general, or a certain war in particular, has a preponderance of eugenic or dysgenic results. Both kinds of results are always present in varying proportions, but it seems impossible to doubt that on the whole the effects of modern war are disastrous eugenically.

What Charles Darwin wrote in 1871, in the *Descent of Man*, is still a good summary of the case "In every country in which a large standing army is kept up," he remarked, "the finest young men are taken by the conscription or are enlisted. They are thus exposed to early death during war, are often tempted into vice and prevented from marrying during the prime of life. On the other hand, the shorter and feebler men, with poor constitutions are left at home, and consequently have a much better chance of marrying and propagating their kind."

During the last few centuries, it does not appear that war is becoming much less common from generation to generation, if the number of combatants (which is the eugenically significant factor) be considered rather than the number of separate conflicts.<sup>172</sup> Since the close of the "war to end war" it is noted

that wars have continued to average about two a year. However, the machinery of international action has been greatly augmented in the last generation, with the World Court, the League of Nations, continual increase in the number and scope of arbitration treaties, and continual increase in the number and scope of international conferences of all kinds.

Theoretically, it would be possible to reform war so that it would be mainly eugenic in effect. It could be fought with elderly men as officers and with mental defectives in the ranks. In practice, however, this spectacle will not be seen. Next to this, the "perfect war" eugenically was one sometimes seen in the past, when rival chiefs bullied each other until each led out his cohorts to fight. The two sides being drawn up in battle array, the chiefs went out in front of the lines for single combat. One killed the other, and both sides retired satisfied. This type of conflict is unfortunately obsolete.

Nothing has been said here about some of the virtues claimed for war, its enhancement of national duty, of the spirit of sacrifice, of cooperation and the forgetting of self for the welfare of all. These things occur to some extent, though the glamour that surrounds war is too apt to make ugly things appear like *disinterested patriotism*. At the close of a war the sordid story of corruption, profiteering, and political mismanagement always appears, to be hushed up as promptly as possible by those who want to maintain the status quo. Even at the best, the national sense of exaltation during a war is followed by a corresponding slump. This, and the resulting post-war economic depression, make crime and greed more prominent than ever. Furthermore this exaltation expresses itself in very narrow channels to divert effort and interest from more worthy efforts toward social advance.

All this, together with the ghastly business of slaughter, might be endured if the end were justified. But it is becoming more and more evident to thoughtful people that as Benjamin Franklin declared, "There never was a good war or a bad peace." Apart from the direct eugenic losses, men of purpose hate war

because it requires that lives trained to constructive ends be snatched away from their tasks and used as relatively unimportant raw material, if not actual cannon fodder, in a game that is unnecessary, profitless, arbitrary, indiscriminating, and essentially childish. The conquest of nature, the betterment of mankind—purposes to which man's powers should be dedicated—are therefore thwarted or frustrated

The fighting instinct is deeply implanted in man's nature, but there is no such specific instinct for the sort of organized intergroup conflicts which make up modern warfare. In these wars "the fighting spirit" has to be worked up by an elaborate machinery of atrocity stories, insulting or derisive epithets directed at the enemy, forgery and fraud on the one hand; and honors, promotions, citations, and decorations on the other. Equally significant are the outbreaks of "fraternizing" during the World War, in spite of continual efforts made by the military commands to prevent this, and the mass desertions in various armies where military discipline was undermined.

The sources of armed conflict can be removed by education, statesmanship, and self-control and by war against the obsolete traditions, greed, and desire for personal aggrandizement which do so much to foment conflict. The more primitive fighting instinct itself can be turned to good use in the endless war against ignorance and disease, crime and poverty. Such changes can be made only when as much energy and ability are put into the natural and social sciences as are now put into the physical sciences. Every step forward in the social sciences is a step toward a better world order. A better understanding of war in all its social and racial aspects should go far to reduce and eventually abolish this hideous and wholly unnecessary aspect of natural selection.

## CHAPTER XIII

### EUGENICS AND RELIGION

How are people to be led to act eugenically? If mere reason is relied upon, it may not suffice. The interests of self are immediate and easily seen, the interests of the species are not so pressing. Natural selection thus favors the ethical and altruistic individual, since he is more likely to leave children to carry on his endowment and his attitudes, while the selfish, short-sighted, or anti-social individual restricts his reproduction, and his qualities, therefore, tend to be bred out of the race. But in the social and economic complexity of modern civilization, the unaided action of natural selection may not suffice to produce the type of man capable of developing a culture that is safely progressive. It is necessary to find strong motives for action in the interest of the group, even when such action may appear to be unfavorable to the individual's own immediate self-interest.

One such motivating force is religion. Without stating that this is the only explanation of the origin of religion, or that this is the only function of religion, one may yet recognize that one of the useful purposes served by religion is to cause men to foster lines of conduct that on the whole will be for the good of the race.

One does not overlook the fact that religion has also at times sacrificed both personal and eugenic values. Cases of flagellation and religious celibacy come to mind as two spectacular instances. Since progress toward eugenic ideals is hampered by the present inadequate motivation toward eugenic conduct, the eugenist looks with eager hope to religion for possible aid. Yet, unfortunately, it is necessary to admit that to date religion has contributed, along with some slight eugenic motiva-

tion, a large mixture of dysgenic motivation. The disentangling of these two threads of influence is the more difficult, inasmuch as widespread religious bias persists.

It is hard to draw a line between what is purely religion and what is mere social pressure, as shown in the folkways, the social standards that lead in successive degrees of social pressure from slight prohibitions all the way to tabu. From this point of view, we may, paraphrasing Matthew Arnold, define religion as *motivated ethics*. Ethics is a knowledge of right conduct; religion is an agency to produce right conduct.

Historically four phases of religion can easily be distinguished, all of which still persist.

1. *Charm and tabu, or mystical reward and punishment in the present life.* The believer in these social devices thinks that certain acts possess particular efficacies beyond those evident to his observation and reason, and that peculiar malignities are to be expected as the consequence of certain other acts. Perhaps no one in the memory of the tribe has ever tested one of these forbidden acts to find whether or not the expected disaster would result. It is held as a matter of religious belief that the expected result would appear, and the believer acts accordingly.

2. *Reward and punishment in a future life after death.* Whereas charm and tabu were supposed to bring immediate reward and punishment, as the result of certain acts, this second system postpones the cumulative results of one's acts to an after-life. The lower effectiveness of remote as against immediate effect is offset by the fact that the reward or punishment in the future is, in the first place, held to be of much greater magnitude than could be experienced in this life, and in the second place is of much greater duration, usually for all eternity.

It is important to note that in neither of the two systems just described is God essentially involved. They are largely independent of the idea of God, since what is called "luck" in some cultures, is in others called the favor or wrath of God. While in some religions, curses are from God, there are others

in which the curses and spells are of purely human or an impersonal magical origin.

3. *Theistic religion.* In essence this consists of the satisfaction derived from doing that which pleases God, or "getting into harmony with the underlying plan of the universe," as some have described it. Theistic religion is idealistic and mystic. It should be distinguished from the idea of doing or believing certain things to insure salvation, which is not essentially theistic. The theist primarily desires to conform to the will of God quite aside from reward or punishment.

4. *Humanism.* This is willingness to make the end of ethics the welfare or totality of happiness of all sentient beings, or of all men, or of some large group of men, rather than to judge conduct solely by its effects on some individual.

It must be noted that most cults include more than one of these elements, usually all of them at various stages. As a group rises in intellectual and social development, it tends to progress from the first two phases of religion toward the last two, but usually keeps parts of the earlier attitude, more or less clearly expressed. The individual adherents of any religion usually have very different ideas of its scope. Thus, the religious ideas of many Christians embrace all four of the above elements. Others who consider themselves equally Christians may be influenced by little more than by the humanist ideal alone, or by the theistic motive alone, or even by the sole consideration of future reward and punishment.

There is no reason to believe that any of these types of religion is the only one adapted to promote sound ethics. Even with the convergences in culture that are developing, uniformity will not appear in the near future. The religion of a people corresponds to some extent to the inherent nature of the mind of that people, as well as to its national or racial traditions and economic organization. Up to a certain point, each type of religion has a distinct appeal to a certain temperament or type of mind. As culture advances, a religion tends to emphasize the interests of all rather than the benefits to be derived by one.

Such has been clearly the case in the history of the Christian religion. The diverse elements of retribution, damnation, "communion with God," and social service still exist, but in America, the last named is yearly becoming more emphasized, in accordance with the emphasis put upon it in the teaching of Jesus himself.

With this rough sketch in mind of religious ideas as applied to social ethics, the part that religion has played eugenically in past cultures is easily understood, and the part that it can play at the present time is readily imagined. The religions of most of the ancient peoples of the Near East seem to have been eugenically defective and none of those cultures was long-lived. The Hebrews are the only exception. The eugenic doctrines of their religion are found not so much in the original Old Testament revelation as in the body of tradition, the Talmud, that developed gradually. Great importance was attached to marriage and parenthood, which carried corresponding honor. Wealthy parents of an eligible daughter sought no husband for her so eagerly as a young rabbi renowned for his promise of scholarship. In this way there was a selection for intelligence. The survival of the Jewish religion through the centuries of dispersion, its transmission to groups that had racially little in common with the original Hebrews, its survival through the subsequent centuries of ghetto repression, and its presence as an active force in every civilized country today, furnish an eloquent testimony to the soundness of many of the fundamental tenets.

The religion of the Greeks provides a striking contrast. Perhaps no people that attained a high culture has had an ethics so defective from a biological point of view. Their civilization was correspondingly short-lived. It used to be taught that Athens in the days of Pericles represented the highest culture that mankind had ever achieved. With a better knowledge of the biological factors in history, this Golden Age is now seen as a more or less hollow sham. If one wants to find a time when Athens had a sound culture with possibilities of survival

one must go back at least to the days of the Pisistratidae. When one considers the change that had taken place by the time of Pericles, the low status of marriage, the contempt for parenthood, the spread of homosexuality, the exaltation of sterile prostitutes at the expense of wives, one is not surprised that within ten years after the famous Funeral Oration the whole structure had collapsed.

The Roman religion was first of all political, simple as to the grounds of its beliefs, complicated as to its ritual. The cult was essentially one of worship. First the family had its domestic worship. When the families grouped themselves into *gentes*, the family worship was extended to cover these new relationships and formed the foundation of the state religion. This state religion enforced discipline, enhanced the feeling of nationality, and promoted unity in a way that even the sophisticates of later generations admired. "It is by religion," said Cicero, "that we have conquered the world." Like the Chinese the Romans considered it of the highest importance that parents have children who would carry on the family worship. With the introduction of Oriental culture and the social and economic changes in the Italian peninsula, the old family worship broke down. Among the measures which Augustus introduced to restore the strength of the state, none seems to have been considered more vital by him than a renovation of the old religion. But it was too late. The sound basis of Roman civilization that had existed at the time of the First Punic War had disintegrated and it was impossible, in the early empire, to stem the tide.

The Chinese religion has long been pointed out as the most striking illustration of group ethics that promotes family and race survival. In the first place, the Chinese put extraordinary emphasis on the need of having children. In the second place, extraordinary measures favor the protection of these children. Duty to one's own family, which consists of all one's relatives, takes rank over one's duty to the state. This fact has been a source of serious weakness to the development of nationality in China. In western countries, to put a worthless nephew into

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a government job is looked upon as a breach of trust. In China, failure to do so is equally reprobated. The important thing is to provide for members of the family, and if this is at the expense of public welfare, that is merely an unfortunate necessity. While the Chinese family system, with its religious basis, has been an incomparable factor in the survival and increase of the Chinese people, and incidentally of their culture, it has nevertheless tended toward a static culture. What effect the heavier impact of western civilization, in the present century, will have on the Chinese family and thereby on the Chinese people, is one of the most interesting questions that can be raised.

Of special groups of Christians, the Latter Day Saints or Mormons have often been cited as illustrating a religion that specially stressed the preservation of the family.<sup>85</sup> Since this phase is often misunderstood, it deserves mention in passing. Popular interest has been too much fixed on polygamy, which is now a dead issue, emphatically outlawed by the modern Mormon policy. The live and real eugenic factors in Mormonism have been nearly ignored by non-Mormons. The point of greatest moment to the eugenist is the doctrine Mormons call "*Eternal Progression*." This involves the idea that human spirits are the direct children of God, created in the First Estate as unembodied spirits. Such spirits possess individuality, they possess moral freedom, and they have already progressed to a greater or less extent at the time when the opportunity comes for them to enter into a human embryo. Of course the bodies available to these spirits are not all equally desirable, but spirits in the First Estate are so eager to make progress into or through the Second Estate, or earth life, that too uncritically they accept bodies which it would sometimes be better to reject. Brigham Young, therefore, exhorted the faithful to "Prepare tabernacles [bodies] for them; take a course that will not tend to drive those spirits into the families of the wicked."

During this earthly life the now embodied spirit may make

progress, or may regress. At death it is again disembodied but yet retains moral freedom, so that later, at and during the Millennium, the spirits reach different levels of advancement. On the Great Judgment Day at the end of the Millennium, God will announce which of the spirits are classified as Celestial. These are progressing at such a rate as to give promise of attaining Godhood. Only those who were married on earth are capable of passing through angelhood and on to Godhood.

It is therefore not only advantageous for a Mormon man or woman to marry, in order to be able later to reach the highest heaven, but it is meritorious to marry because in this way one's mate is likewise enabled to reach this desired goal. As a consequence there are few celibates and marriages occur early. In its young people's organizations, the church not only promotes social contacts within the group but makes a definite and systematic effort to promote good mate selection in classes and society meetings. And the birth-rate has fallen less among Mormons than among any other Christian group of equal intelligence and socio-economic level. Thus among young people attending the University of Utah summer school, 1925, those whose parents were Latter Day Saints came from families the modal size of which was six, median five living children. Those whose parents were Protestants came from families whose modal size was two, median three living children.

Mormonism is perhaps thus entitled to rank with Chinese ancestor worship and with Hinduism, as one of the three important present-day cults which most effectively encourages a low rate of celibacy and a high rate of reproduction. The high fecundity in Hinduism results in large part from the early age of marriages in India. The custom of early marriages has come about partly to avoid intermarriages with Moslems, but mainly to insure having a son to perform ceremonials at one's grave.

Religion has properly been given great credit as the defender of chastity. The eugenic value of chastity lies mainly in three factors:

(a) The superior survival of the child who attracts more paternal care, as he does when a man is convinced that he is the child's father.

(b) The reduction of sterility arising from venereal infections.

(c) More deliberation and care in sexual selection where a relatively permanent mate is being chosen rather than a temporary one.

It would be a great gain in religious teaching if chastity were more clearly shown to be based on cogent rational grounds, rather than merely a dogma. In every generation there are young people who experiment with premarital sexual relationships. Why does this custom not spread? Evidently because it lacks survival value; because the results are found to be disappointing by a majority of the experimenters.<sup>88</sup> Among the causes of this are the following:

(a) The experience is disappointing because under the circumstances it is little more than auto-erotic.

(b) It results too frequently in the tragedy of unexpected pregnancy.

(c) It leads to broken friendships more frequently than to enhanced satisfaction in personal relationships.

(d) Infection with venereal disease is still a common result.

(e) Mental unrest and dissatisfaction result from the conflicts between the mores or standards of different groups, with each of which the individual is concerned.

(f) There is a loss of integrity, due to the deceit, secrecy, or furtiveness which almost always accompanies premarital sexual experimentation.

(g) Mental discomfort is produced by the conflict between normal cravings for adventurous variety and the equally normal cravings for permanence, security, growth, and (especially among young women) parenthood.

(h) It leads to manifestation of the same destructive effects that any unintegrated impulse has on the personality.

(i) It is likely to narrow the circle of possible and desirable choice in permanent mating, later.

(j) *It takes the edge off of marriage and results in less satisfactory marriage and less satisfactory life in the long run, as shown in a number of investigations.*<sup>11b</sup>

Again, religion rightfully claims much credit for the extolling of children as such, as in China and Japan. This extolling of children remains a feature which gives promise of greater usefulness in the régime of voluntary reproduction. But unfortunately, the solitudes about chastity and fecundity have overflowed into the evils of celibacy and of unadjusted fecundity. In the matter of advocating celibacy, Christianity and Buddhism have been special offenders. Judaism on the contrary has been notably successful in avoiding this eugenic evil.

The slipping of Christian teaching as regards eugenics, from the sounder Judaistic position, is attributed largely to Paul with his *slighting remarks on marriage and his praise of celibacy*. The doctrine of the virgin birth with its intimation of the unworthiness of a natural birth following a biological impregnation also was strengthened by Paul. If, on the average, the religious celibates were inferior, there would be no net eugenic loss, but this is not the case, especially with many celibate males who are held to higher scholastic standards. Fortunately in both Christianity and Buddhism celibacy is being abandoned by sect after sect, some notable instances of this trend among Christian sects being seen in central Europe at the close of the World War.

As to fecundity, the curses of the Orient are largely the product of overpopulation brought about by religious attitudes. Sound eugenic and euthenic progress calls for a recognition of the doctrine of the optimum population, or what E. A. Ross calls "*adjusted fecundity*."

By way of summary, Christianity is particularly favorable to eugenic progress in its general emphasis on sound family life as the foundation of social welfare, in its social loyalty, which was such a prominent feature of Jesus' teachings, in its regard for children, and in its maintenance of high stand-

ards of personal chastity, making for better mate selection and more permanent and successful marriage.

It is easier for religious readers to exhort in absolute fashion—"Thou Shalt" and "Thou Shalt Not," in plain black and white. It is easier too, for religious followers of simple understanding to grasp absolute dicta, than to have to weigh and ponder as they would need to with the more quantitative dictum, "just so much." Yet scientists will increasingly talk in terms of middle course and multiple factors. If religion can not accommodate its dicta to the situations where quantitative and relative evaluations should prevail, religion should leave the field of determining what is right and restrict itself to motivating the codes that shall be written as scientific products.

We believe, however, that the retirement of religion from the ethical field is not necessary, that the wiser course is for religion to consider ethics as a science and to accept from science analyses often far removed from the black or white acts uniform for all persons, which religion has often portrayed. Concretely, this will mean that the church will consider celibacy not as a good in itself, but as being good for some people who are unfit for parenthood, while under normal circumstances marriage will be considered better for the rest of the population. It will mean that the size of the family must be proportionate to the quality of the parents. Where these are of medium quality, an "adjusted fecundity" is indicated, which will sustain the population at an optimum level. Where the parents are below a given standard, religious teaching should support the ethical conclusion that no children should be born to them. For superior parents, a number of children above the adjusted fecundity is desirable.

Here is a test for religion. Can it embrace a progressive and scientific code of ethics, rather than an over-crystallized and over-simplified code of ethics? It is interesting to consider some of the changes of emphasis that would result. In addition to those just mentioned, concerning size of family, some other desirable shifts of attitude are the following.

(a) Society should value industry, efficiency, creative endeavor, far-sightedness, more highly as evidence of "goodness."

(b) Society should attach greater value to long-term measures for the betterment of mankind, such as eugenics, hygiene, penal reform, conservation, in comparison with short and spectacular activities whose result is immediate but limited

(c) Society will continue the present trend toward a more discriminating evaluation of charities and philanthropies, the mere goodness of intent and appeal to sympathy not being *sufficient to make them equally regarded.*

(d) Society will work more vigorously to reduce the dominance of narrow clannishness, class interest, and bogus patriotism, in favor of the interests of the whole species.

(e) Society will foster a greater respect for the scientific method and a scientific approach to social problems. These were formerly suspected because often subversive of tradition. They are now seen to be the necessary means to attain a knowledge of what is good.

In still another important sphere, religion is undergoing a searching self-criticism. It has been shown that modern war is highly dysgenic. How does religion react to it?

As W. E. H. Lecky has shown, the early influence of Christianity was bad in this respect, severe and bloody struggles arising from partisan interpretations of the Trinity and other theological dogmas. Later came the religious campaign of the Moslems with the sword and the somewhat corresponding crusades of the Christians. Subsequently, religions have but rarely instigated wars, though generally the religious leaders have been zealous in championing wars once started. Fortunately, a newer religious attitude can be observed. It started with the religious pacifism of the Quakers and Mennonites and the idealistic but weak social pacifism of the socialists, exclusive of the communists. Future wars which are classified as wars of aggression by the League of Nations will face divided counsels in the churches and are likely to lead to schisms, as Negro slavery led to the division of American churches a cen-

tury ago. If constituted religion can not make the adjustment, will a new religion arise to meet the need or will the world face another outbreak of the old warfare between science and theology made famous by Andrew D. White? It seems more likely that one of the former courses will be followed with the "warfare" becoming tempered.

Without spending time on the divergencies of church doctrine and the vagaries of church history, one may well ask just what the average American church of the present day can do, in concrete and practical ways, to promote a sound eugenic ethics. In order to get a broad basis of opinion, we put this question before several hundred young and middle-aged people, all interested in the welfare of the American family, and nearly all of them church workers. We summarize their suggestions without regard to the order of importance.

1. The point of view of the church should be more social and less ritualistic, even in churches where ritual is considered negligible.

2. The church should get out larger groups of young people. That it can do this is proved by many striking illustrations, but in general, during the last generation, the church has lost its young people. It is estimated that of those of college age, not one in ten is now a regular attendant of any Protestant church. Measures suggested to get back the young people included the following:

- (a) Give them what they want. Most of them do not care merely for the formalities and traditional apparel of church services. They are vitally interested in acquaintances, in discussing topics that touch their own welfare or activities, and in public service.

- (b) Enlarge the young people's group by having more joint meetings and exchange programs. One of the main difficulties with the average young people's society or class is that it is too small, and tends to consist of little cliques or persons who have been going together for a long time, who call each other by their first names, who are more or less paired off socially,

and who do not altogether welcome any newcomer, because the newcomer is likely to be a social competitor. Hence, the social opportunities provided by such young people's church groups are often not merely inadequate but unfavorable. If the young people's societies of a given territory or a given denomination would meet together more frequently, the newcomer would find not a group of twenty or thirty, but a group of two hundred or three hundred, in which to form acquaintances.

(c) *Maintaining fewer churches would promote larger groups.* The church, it was pointed out, is still living in a horse-and-buggy age, though the automobile is now available, so that it is as easy for people to drive ten miles to church as it was formerly to drive one mile. It was urged that consolidation of weak churches would give many of them more vitality.

3. The need of a different type of leadership and personnel, not too old, was listed as a prerequisite by many of the group engaged in this survey.

4. Correspondingly, it was urged that the young people in the church must be allowed to run their own affairs, and not be continually subjected to interference, dictation, or veto of the elders, who do not sympathize with them.

5. The work of the church and Sunday school must be tied up more definitely and organically with the daily life of the community. This involves (a) the general outlook and emphasis of the minister and the whole organization; and (b) a more active participation of mixed groups of young people in both study and service. Through such participation it is felt that the best opportunities for acquaintance will be found.

6. The church must develop its teachings more on rational appeal, less on mere tradition and dogma. Underlying every important doctrine of the church, there is probably a social experience which, as stated earlier, has shown the doctrine to be valuable. The young people of today are no more impressed when told that monogamy is "in accordance with God's eternal law" than they are when shown the reasons for the survival



of monogamy, its gradual replacing of competing systems, and its contributions to personal happiness, social stability, racial progress, and the welfare of children.

7. Members of the church should open their homes to young people and, in the many cases where these young people are separated from their own homes, give them some of the advantages of home life, including the opportunity of meeting other like-minded people.

8. Young mothers might be given some help with their children, certainly by a day nursery on Sunday morning, so that the mothers could attend services. The church might well provide similar help throughout the week. It would often be possible to find some of the younger members of the church who would be glad to assist in making this day nursery feature one of the real attractions of the church, and would thus help to solve one of the great problems of parenthood today, by giving the mother who can not afford help in the home, a chance to get freedom once in a while for recreation or other purposes.

9. Similarly young married couples should be given more definite help with the problem of their recreation. The experience of the Institute of Family Relations in Los Angeles and other investigations have shown that one of the fundamental difficulties of modern life, tending to produce a low birth-rate and family instability, is inadequate use of leisure time. For many persons the church could make a real contribution at this point.

10. The church or Sunday school should have better educational facilities for aiding young people with problems that are neglected in the week-day educational system, particularly the problems of sex, marriage, and parenthood. In this way the religious schools might well supplement the secular schools. A few good books in the lending library, the provision of intelligent reading lists, and occasional talks from specialists would put young people in touch with the great body of information that is still too often neglected in the formal educational system.

11. The church might well take a more intelligent and aggressive attitude on a positive approach toward marriage and family life. Local community conditions that are unfavorable could be studied and when possible removed or offset. Measures could be promoted that would improve conditions, such as the enactment of a banns law or three-day marriage law, in states which still lack this. Examination and education before marriage could be preached and local facilities made available for this purpose. If the church threw into the conservation of the family, during the next generation, as much zeal, energy, and consecration as it put into the abolition of the saloon during the last generation, the results should be tremendous.

12. Finally, it is felt by many church members that the church's attitude toward marriage should be revised and that more personal responsibility for this should be accepted by the minister. As an officer of the state, empowered to perform marriages, most ministers assume that their responsibility is discharged if they have seen that the bride and groom present a legal marriage license. The minister may have seen neither of the contracting parties before, may not know whether they have any educational or other preparation for marriage, whether either of them is physically fit for marriage, or whether either of them has already a living mate. It is well known that many of the candidates for marriage are wholly unfit for it and that to marry them is a mockery. Yet the average clergyman does not hesitate to give them the benefit of the blessing of the church. It is held by many church members that such an attitude is incompatible with Christian principles and with the dignity which should surround a marriage that the church is asked to sponsor. There is a growing opinion, which has already been made a matter of church legislation by some Protestant organizations (as in some respects long ago by the Roman Catholics) that the minister should not marry anyone unless he is given evidence that the marriage, in the light of certain standards, may well be made. Others who want to be married can

take advantage of the state's lax supervision and avail themselves of the services of the Justice of the Peace.

With some such policies as the foregoing, vigorously carried out, it seems probable that the church in America could lend much greater motivation to a sound eugenic ethics than now exists. Many churches already have social halls or other premises suited for recreation; those that lack them can add at least a modest hall with little expense, and it should then be made attractive to the young people of the community every day in the week. This program should be reinforced by summer camps, field meets, picnics, and as many other types of bisexual activity as possible. Even from the narrowest selfish point of view, the church could not do itself a greater service than to build up a strong foundation of young people from which its own membership could be continually replaced.

Beyond this, the church as a foremost charity worker might well adopt the principle that relief and support would be given to people who are clearly below a reasonable eugenic standard of fitness, only on condition that they should not reproduce themselves. And as the foremost agency of ethical culture, the church can do a great service if it will eliminate from its body of doctrine all survivals of the medieval contempt for "the flesh," and inculcate a sound basis for appreciation of marriage, together with the obligation to mate wisely and to bear a number of offspring proportionate to the needs of society and the eugenic quality of the parents.

Eugenic progress is highly dependent on a motivation by which the individual will seek not merely his own good, but that of mankind in general, now and in the future. No agency seems better adapted to reach great masses of people with a eugenic ethics, and to infuse this with the necessary emotional basis that will result in action, than the church.

## CHAPTER XIV

### THE IMPROVEMENT OF REPRODUCTIVE SELECTION

#### 1 SEXUAL

In looking for means by which a larger proportion of the superior young people of the community may be enabled to marry, and to choose their mates wisely, one begins by asking what their own ideals are in this respect. One knows that these ideals, like all others, will not be fully put into effect. Nevertheless they determine to some extent one's final choice, provided opportunity for choosing is not too much restricted.

Many studies have been made on this subject, particularly among college students. On the whole, they do not vary greatly, and one illustration will serve nearly as well as a dozen. Here are, for comparison, the qualities of the ideal wife as outlined by men of California Institute of Technology, and those of the ideal husband as outlined by women of Teachers College, Columbia University, the qualities being listed in the order of their importance as expressed by the makers of the lists:

LIST MADE BY MEN	LIST MADE BY WOMEN
<i>Ideal Wife</i>	<i>Ideal Husband</i>
1. Intelligence	1 Health
2 Congeniality and compatibility	2 Character
3. Health and physique	3. Emotional normality
4 "Good looks"	4 Disposition for fatherhood
5 Home-making ability	5 Intelligence
6 Character	6 Personality
7 Education	7. Companionship
8 Disposition for motherhood	8 "Good provider"
9 Understanding, fair play, coöperation	9. Coöperation
10. Personality	10. Social disposition

Without placing too much importance on the order of these traits, *one must recognize that if the specifications were met, in both sexes, they should result in a successful marriage.*

The women went a step further and outlined in much detail what they thought to be the defects in the education of modern young men, that made them less desirable than they should be, as husbands and fathers. The points most particularly listed (without regard to order of importance) were:

1. Lack of courtesy, chivalry, etiquette, and manners.
2. Lack of neatness, "polish," pride in or care for personal appearance.
3. Lack of understanding of women and of respect for a woman's point of view.
4. Lack of knowledge of foods and lack of sympathy with the wife's effort to provide a proper diet.
5. Lack of knowledge of and interest in home-making and child care; failure to have cooperative attitude in regard to the work of the home.
6. Lack of general culture, with too great absorption in business, and too much emphasis on the dollar.

To some extent, these indictments perhaps reflect a tendency of each sex to think that the other should behave just like itself. But more generally, they point to certain serious defects in the education of young men for marriage. Many boys, according to widespread opinion, are spoiled by their own mothers, who pamper and coddle them, let their sisters wait upon them, do not oblige them to assume any responsibility for the work of the home or even for the care of their own clothes. Further harm is done to both sexes by the all too frequent absence of suitable patterns of successful family life. The two sexes do not understand each other, and the female in particular has failed to make up its mind what it wants its status in society to be, hence a frequent lack of understanding between husband and wife. Educated women have come, largely as a result of their education, to have many conflicts as to the part they want to play in the world. They are often not sure whether they want to marry and give up work, or marry and continue to work; whether they want to marry at all or prefer a celibate career; whether they want a 50-50 mar-

riage or prefer to depend on a husband whose strength and competence they admire; whether they want children or not; whether they want to spend their time with their children or be freed for other work. Such conflicts, often unconscious, make it difficult for even the most considerate and sympathetic husband always to understand his wife and meet her wishes.

Finally men, like women, are victims of an educational system which often gives no definite preparation for marriage and sometimes give an outlook that actually handicaps its possessor and makes success in the future more difficult.

While there is need, then, of better education on both sides, the young people's ideals are on the whole high. How far they are valid is a question that would be difficult to settle offhand. It appears that the following traits (again without regard to order of desirability) are important in making marriage a success:

*Emotional normality*, both as to congenital endowment and freedom from fears, inhibitions, distortions, produced by faulty education or unfortunate experiences in earlier life. Without this basis, it is difficult for anyone to succeed in marriage. A sexual maladjustment underlies almost every unhappy marriage.

*Character in general*. The qualities that make one succeed as a citizen are almost equally likely to make one succeed as a husband or wife—provided the individual has with these qualities the proper technical knowledge and attitudes.

*Comradeship*. This includes not only a naturally favorable disposition and good mental hygiene, but sympathy with the other's aims and interests, a broad-minded tolerance, and an understanding of the differences between the two sexes.

*Competence for the job*. This covers economic adequacy, ability to manage the household successfully, ability to handle the children properly.

*Love of children*. Without this (fortified by wisdom and proper training), one is likely to miss the finest features of marriage.

*Intelligence.* Unless a marriage is successful, as indicated in this analysis, its eugenic value is greatly impaired, for its duration and fecundity are affected. The prerequisites to successful family life are five:

1. Each mate should bring a good inheritance. (The genetic basis.)
2. A good personal character on each side (The ethical basis)
3. A family pattern: Made up of the children living with the parents. (The psychological basis.)
4. An adequate income is required, or at least ability to live on the income that is available. (The economic basis.)
5. The necessary information needed by the couple to make satisfactory adjustments. (The educational basis.)

After asking young people how they expect to select their husbands and wives, it would be desirable to ask married persons why they actually selected the mates they did. This investigation seems not to have been made,—perhaps from a suspicion that many of them would be unable or unwilling to tell.

Successfully married persons ought to be able to tell, however, in the light of their own experiences, what they consider the most important essentials of success. Such an inquiry was made by Mrs Chase Going Woodhouse<sup>168</sup> of 250 highly educated and successfully married couples, and the essentials which they enumerated in reply amounted to 2,208. So far as this mass of material could be analyzed and condensed the following factors were most stressed:

1. Attitudes, personal traits, and relationships.
2. (But a long way below the foregoing) Economic factors.
3. Personal ideals.
4. Social training.
5. Formal education.
6. (But again of a much lower order of magnitude) Health.

Such analysis does not change materially the ideals expressed by young people, such as outlined earlier in this chapter. Instructive comments were given when each husband was

asked what he considered the outstanding asset of his own wife, that made her a particularly valuable mate; and the wives were asked similarly to evaluate their husbands. The husbands almost all emphasized some such quality as "her ability to do the job," her competence to meet the responsibilities of wifehood and motherhood. Most of the women, on the other hand, stressed their husband's companionability.

No matter how satisfactory one's ideals, the fulfillment of one's ideal is limited by range of choice, to be discussed later in this chapter, and by one's inability to learn the backgrounds of eligible persons one meets. The latter situation is a serious handicap to all mate selection in every civilized country. As yet no adequate method of overcoming it has been determined, and many tendencies of the present day make it worse. The frequent moves of modern families; the fact that a young person may be a thousand miles away from his or her background; the unwillingness of educators and administrators to have mental test ratings published; the unwillingness of some social workers even to have the fact of illegitimate parenthood published; all such difficulties are often insuperable to the young man who has met an attractive girl and would like to find out something more about her. At present he is limited almost entirely to what she tells him. She will probably be honest enough to tell him the truth. If she does not, so much the worse for both of them. The problem of the woman is even more difficult, for she is less likely to see the man's home and parents than he is to see hers.

While short engagements have some advantages, a reasonably long period of acquaintance before engagement is highly desirable, fulfilling at least three functions:

- 1 It makes possible better sexual selection. How much this is needed is shown by the results (described in Chapter XI) of state laws providing a few days preannouncement of the intended marriage, a delay which leads to the abandonment of thousands of marriages each year, even after applications have been made for their license.



2. It is an apprenticeship in mutual accommodation, enabling a couple to find and remove points of friction, so this whole adjustment does not have to be carried out in the first year of marriage.

3. It is a stimulus to biological and psychological maturation, that is often indispensable since so many young people grow up without proper adult patterns of behavior, without enough chance to learn what the opposite sex is like, and with a retarded emotional development that may wreck the marriage, unless it has been gradually overcome beforehand.

Doubtless one of the reasons for the great success of marriages among people who have gone to college together is that they are likely to come from similar backgrounds and, in any case, they get to know a good deal about each other in the course of a year.

It has been suggested that colleges might assign a "eugenic rating" to the members of the senior class, this to be compounded perhaps of the intelligence rating, of a rating for physical health, and of a rating for ancestry. This combined rating would be given to each member of the class, but only the names of those who ranked in the upper 25% would be given out. This would call attention to graduates who might be good eugenic material and who perhaps for some other reason might be passed over.

Just as a Phi Beta Kappa key or election to some other honor society singles out a certain group, and often gives a real advantage in getting a job subsequently, so it is argued that such a eugenic rating might be a real help to those who deserved it. While every such proposal arouses a curious emotional resistance the suggestion is an interesting one, and it would be worth while for some college to try it out and see how it works.

The objection is at once made that such a step would produce an objectionable amount of snobbery. Snobbery is in itself to be avoided, but in this instance the students already live in a world of discriminatory evaluations; based on money

(as shown by expenditures), family status, beauty, athletic prowess, holding office in student organizations, and class marks. These data are public, often flaunted. The introduction of one more measure would not increase snobbishness, but might on the contrary tend to remove the snobbish element from some of the present evaluations.

Meanwhile, every opportunity ought to be taken to get more information about people on record and to have this record open, at least under proper safeguards, to public inspection. This runs counter to a deep-seated prejudice which holds that every one is entitled to misrepresent himself, that his life is his private affair; and that no one else should know the truth about it. So well rooted is this attitude that a man frequently succeeds in concealing the truth even from himself. And people will go to great lengths to falsify records in order that the existence of a mentally diseased or mentally deficient relative, for instance, may not be known in a pedigree. Such an attitude is anti-social and dysgenic, and will have to be overcome gradually by education; but it is futile to suppose that it will be easily, quickly, or completely altered.

Since individual happiness, social welfare, and eugenic progress depend so largely on successful mate selection, the subject deserves much more attention than it has received. For the individual, preferential selection is of the first importance. From an evolutionary point of view, assortative mating is also important. Though not of itself a rapid way of promoting evolutionary progress, it is nevertheless important in man as promoting happiness in marriage. This in turn is favorable to the production of more children, and to their own successful marriage in the future.

In order to make any kind of successful selection of a mate, one must want to marry, must have an opportunity to meet others who also want to marry, and must be sufficiently normal, competent, and attractive to win one of these as a mate.

In a primitive society, virtually every one wants to and does marry. In the United States, 10% of the population that reaches

45 years of age has never married. Those who remain unmarried from preference are probably a minority of this number, and may be guided by various motives.

1. Some refuse to marry because impaired physically, as by syphilis, or mentally, as by epilepsy, or because they fear to pass on an inherited tendency to mental disease or some other handicap. Failure to marry, where it is not feasible to maintain a sterile marriage, is laudable in many cases. However the possessor of a eugenic conscience is likely to be above the average in intelligence and altruism, and there is always a danger that he may allow a possible small handicap to overbalance certain and large advantages which he could pass on to posterity.

2. Some turn their backs on marriage because of the ascetic ideal,—the belief that they can be of more service to mankind by single-minded devotion to human welfare, without the complications and distractions entailed by a family. Several of the great religious organizations of the world enforce celibacy on their leaders, thus depriving themselves and the world of the racial contribution of those whom they regard as particularly able.

3. Probably the largest number of those who deliberately choose not to marry are emotionally abnormal. They may be the victims of sex fears, of homosexual trends, of antagonisms toward the opposite sex, or of mere cowardice based on feelings of inferiority. While such distorted attitudes toward life are sometimes due to biological inferiorities, they represent more often the results of unfavorable home environment, faulty education, and the effects of arrested emotional development growing out of the absence of a normal family background and the overemphasis of herd tendencies in modern city life. These abnormalities are therefore preventable in most instances. In the other instances a eugenic advantage accrues from the celibacy of such individuals.

4. Finally, some shun marriage because absorbed in careers which they find too interesting to permit distraction; or be-

cause they are so driven by a desire to "climb" socially that they are unwilling to divert any of their attention to the establishment of a family, or because too selfish to undergo any limitation of their independence or division of their income. Such traits, again, are in many cases the result of faulty education, and do not necessarily argue a defective inheritance. Eager pursuit of a career is more likely to interfere with a woman's marriage than with that of a man, because the latter can combine professional advancement more easily with family life than can most women. On the other hand, most women who have sacrificed marriage to a career have not done so altogether willingly, but have become gradually and unintentionally cut off from opportunities for marriage, the loss of which they bitterly regret as they grow older.

So little does marriage really handicap the individual, however, that any such handicap is offset by the other advantages possessed by married men. Studies of Harvard and Yale graduates have shown that those who had attained the greatest worldly success were in general those with the highest percentage of marriages and of largest families. Those who had done indifferently well in the world were found either to have had few children or to be childless. Furthermore, the relative "failures," from a material point of view, included most of the bachelors.<sup>78</sup>

While vigor and persistence are doubtless promoted by the responsibilities of a family, just as peace of mind and efficiency are promoted by the cooperation of a life partner, it is obvious that the differences between those who marry and those who do not must be important. The man who is a failure in life because of undesirable traits and unfortunate personality will often be unable to face the test of marriage, just as he will often be unable to face the other tests of life.

Unmarried men and unmarried women contribute a quite disproportionate share of the inmates of jails, sanitariums, and mental hospitals. Furthermore, at the significant ages the mortality of bachelors and widowers is much higher, in some

instances as high as 50% in excess.<sup>60</sup> The cause is germinal in a large enough proportion of these cases to make the result eugenically favorable.

Any social policy, then, which might force into marriage a large part of the unmarried must be regarded with suspicion. Decidedly some of the unmarried ought never to marry. Under present conditions, to have 10% of those of marriageable age unmarried (or married and sterile) is not too large a proportion for the promotion of social and eugenic progress. The chief criticism to be directed against present conditions is that this 10% is only in part selective; that it contains many who should have married, while among the married are many defectives who might well have abstained from marriage.

The social measures most needed, in this connection, are those which will prevent superior persons from being forced against their will into lifelong celibacy. We are reconciled to seeing many people remain unmarried. We are not reconciled to seeing any superior person remain unmarried simply from lack of opportunity.

The lack of an adequate range of social contacts in the late adolescent and early adult years is responsible not merely for much celibacy, but for much delayed marriage and marriages with less approvable mates. This lack is in turn due to the disorganization of family life and other changes following the economic and industrial changes in the last few generations.

The family has lost, to a large extent, its recreational function, and in a modern city few young people meet friends in their own homes. The church, which formerly served as a meeting place, has largely lost the young people, though there is plenty of evidence that it could get them back if it offered them anything they wanted, and in particular a normal social life. Urban social organization, defective from many points of view, is particularly defective in its failure to provide any machinery whereby young people can meet socially, under favorable auspices, with those of their own kind of the opposite sex.

For the educated part of the population, the main burden

of providing social contacts that may later result in marriage has been put on the school system. The following tabulation shows the place of first meeting of 1,507 married couples, representing every part of the United States, who are in the college graduate strata of society, and of 518 couples (data of Miss E. Beatrice Barnes) in Northern California, forming the friends and relatives of a group of evening high school students and therefore of a somewhat lower economic and educational level:

<i>Place</i>	<i>Evening High School Level</i>	<i>College Level</i>
Commercial recreation	21.4%	2.1%
Business contacts	14.9	12.1
Travel and recreation	14.1	7.1
Educational system	12.9	33.2
Private home	11.4	15.7
Miscellaneous	7.9	0.6
Church and church social organisations	6.4	8.7
Private recreation	5.4	12.0
Propinquity	4.2	8.2
"Pick-ups"	1.4	0.3
	<hr/> 100.0%	<hr/> 100.0%

Since the school is the only institution that, at present, deals with all normal young people in the community, it should meet its responsibility squarely. Changes in the colleges are important, but the main responsibility must fall on the high schools, because so many of the population never go further than high school. The fact that those who go to college are on the whole a superior part of the population, however, makes the responsibility of the college all the greater. A number of changes need to be made in many schools, to promote a well-balanced education and to prepare students to get along successfully in a world which is made up of two sexes in equal numbers.

1. Changes in the type of curriculum are gradually appearing. More classes in home-making, including suitable classes for boys, have been found extremely successful. More mixed athletic classes would be desirable, particularly when folk or

social dancing can be elected. This has often been found to be the most successful way to socialize, not to say civilize, some of the students. An orientation class in etiquette is always popular, particularly among boys, while art and clothing classes for girls can aid them in making themselves attractive. Existing courses in history, ethics, science, citizenship, and the like, should deal more definitely with the problems of the students. Some of the traditional courses, notably some in literature and foreign languages, are too frequently taught with the purpose of giving students an accomplishment for invidious purposes, rather than a value for the individual and society. Such courses should be elected more discriminatingly with reference to the values for the specific student.

2. Methods of teaching need revision in many cases to provide more informal class work and socialized recitations. Groups or committees of students, carefully selected, should be assigned to special trips or investigations, and much freer use should be made of field trips. A Saturday collecting trip for a biology class, for instance, may enable the members to get better acquainted than a whole semester of classroom work. It has the further great advantage that every one in the class is compelled to go, so that the diffident and seclusive can not stay away; and yet no one feels self-conscious about going with the thought that it is to benefit him socially. In other classes there should be more discussion groups, more emphasis on good public speaking in class work, and especially there should be more problem-solving through group thinking, which in some respects has been found superior to individual thinking.

3. In the set-up of the school, the home-room plan should be widely used in secondary schools. Longer class periods with less home work assigned are desirable. Smaller schools, smaller classes, and co-education in all classes would help the student to meet problems such as he will meet all the rest of his life. Credit should be offered for such mixed activities as orchestra and glee-club, so that there will be less avoidance of them on the part of the student. Class organization should be empha-

sized and in connection with student government, students should be made responsible, with adequate help, for the social activities of the school. A definite part of the school budget should be set aside for this purpose; and if a school can afford a school athletic director or school nurse, it can also afford a school social director. Student activities should be better coordinated, as through teamwork of the Hi-Y and Blue Triangle groups, or others comparable. In addition to a school clinic, or wise dean, or personnel officer, to deal with social problems of individual students, it has often been found helpful to have a selected group of senior students make themselves individually responsible, each for one underclassman who seems particularly to need drawing out. This is done without any knowledge on the part of anyone else that the friendship has any ulterior reason. The timid or unsocial freshman who finds an admired upperclassman interested in him, urging him out to activities, and suggesting desirable lines of action, is sometimes much more inspired than he would be by even the most scientific mental hygienist on the faculty.

4. Extra-curricular activities are, in many respects, the most useful means for socializing a student body. The more informal they are, the better, and one objective should always be to find ways in which all members of a group may be induced to participate. Otherwise there is danger merely of intensifying the present undesirable situation, in which a small part of the student body has more social life than is good for it, and the great majority has not nearly enough. In many schools the second half of the luncheon hour is set aside for social purposes or for informal dancing, either with phonograph, radio, or the school orchestra. Informal tea-dances may be given in the afternoon; and since the students merely stay after the last recitation period, the whole problem of dress and expense, display and transportation, is simplified, and no one feels inclined to stay away because unable to wear new clothes. Swimming parties, class parties of all kinds, art clubs, music clubs, hikes, canoeing and week-end camping trips, special holiday cele-



brations, faculty entertainment for small groups, little theater organizations, the school paper, and the like, all offer favorable opportunities for young people to get along with their fellow citizens. This is an important part of getting through life pleasantly and profitably. Abundant use should be made of special-interest clubs—nature, art, photography, collecting, foreign language, or whatever may be desired. The most backward and shy student may often be gotten into such an organization by a little special interest shown in him on the part of the older members. In general, all extra-curricular activities should be made as informal and inexpensive as possible, and should provide for the general participation of the whole group—not merely for the most popular.

5 In the case of college students, the housing situation could be improved in most instances. Dormitories should have joint recreation rooms and dining rooms in common. Less formality should be the rule in cafeterias, the sexes being encouraged to avoid segregation. Where students take their meals in a college dining room or in commons, an invaluable opportunity is missed unless they are seated systematically in mixed groups and change tables at intervals. In this way, before graduation, each has a chance to become informally acquainted with almost every member of the student body. Recreational rooms and browsing rooms in libraries enable people to meet others who are like-minded. In no respect is the monastic tradition in modern education more manifest than in its planned social life. Every trace of this should be eliminated as 500 years out of date. A card index with the names and both local and home addresses of all students should be available in the registrar's office, where it can be consulted by anyone without formality or the assigning of any reason for the inquiry.

6. Changes in the teaching personnel at all levels are as important as any one thing, in the judgment of hundreds of mature graduate students who have contributed their experiences for this chapter. Teachers must be selected for their personality, their broad and sane outlook on life, their own experience

of normal social relations, and their interest in their pupils' all-around development, quite as much as for the teacher's summer-school units and advanced degrees. Too often the career teacher is a warped and unadjusted individual himself, who either fails to make any contribution to the students in the ways just mentioned, or gives them, both by precept and by example, definitely harmful patterns of behavior. Under the tenure laws in many institutions, it is difficult to get rid of an undesirable teacher, even when he has become almost psychopathic.

Not only should administrators take greater pains in selecting their personnel, but teacher-training institutions should take greater pains in sifting applicants for matriculation, and be quite as ready to reject a candidate with inadequate personality as they are now to reject a candidate with inadequate credits. With the increasing number of applicants for teachers' positions, and a probable decrease in enrollments both in high schools and in colleges during the next decades, it will be possible to pick teachers with a greater range of choice than ever before. Selective elimination can be made still more on the basis of personality and temperament. It will be unfortunate if the increasing pressure of competition for jobs simply leads to a rise in scholastic requirements, rather than in higher standards of genuine fitness for teaching.

In high schools, it is particularly important that teachers be able to participate in the social life of the students, as chaperons or otherwise, to promote happy relationships by helping in the planning of social affairs, arranging introductions and escorts. Teachers should be able to accept with poise the puppy-love manifestations of their adolescent pupils, instead of registering flippancy, alarm, or innuendo. As many as possible should have homes of their own where students can meet, (school funds might defray expenses of such parties); and they should be able to cooperate with parents in understanding the emotional life of adolescents and in planning for its conservation.

The tendency seen in some school boards to exclude the married woman as a teacher bars many excellent choices. This adds one more to several valid considerations against this unfair discrimination.

It is scarcely necessary to point out that a socialized education such as has been outlined is more than eugenic. It is quite as necessary for the teachers to promote sound mental hygiene and normal emotional development in their students, even should these never marry. But it is all the more important since most of them are in fact going to marry, and in the case of college students most of them will marry schoolmates or the friends or relatives of schoolmates.

There are certain other features of the educational system that deserve especial consideration from the eugenic point of view. One of them is the supposedly philanthropic and benevolent custom of providing a scholarship loan fund from which deserving and needy students may get financial help in completing their courses. After graduation they go to work to pay back the loan so that the fund may be kept intact to serve its purpose indefinitely.

At first sight, the scheme looks so good that many a class or organization has thought itself very virtuous for establishing such a fund in the alma mater. But what happens when the beneficiaries of the fund graduate, and when their fellow alumnae are marrying? The girl who is loaded with debt is in an embarrassing position. She feels this particularly to be a debt of honor, to be paid back as soon as possible, so that some other student may benefit by the same privilege that was accorded her. If she marries at once, she knows that she jeopardizes the payment, unless she unloads the responsibility upon her husband. It is a delicate matter to suggest to a suitor that acceptance of his offer is contingent on his assumption of one's floating indebtedness. So the conscientious girl sometimes turns her back on suitors, and avoids possible contracts of marriage, until her debts are paid. By that time the men with whom she graduated, or with whom she formerly associated,

have married other girls. Good husbands are picked off early in life and the number of unmarried men over 30 who are desirable in marriage is small. A college girl's chances of marriage, never too good from a statistical point of view, diminish quickly during each year after graduation. By the time, then, that the college girl has paid off her college debts and is ready to think of marriage, her opportunities may be gone. The loan fund has condemned her to celibacy for life.

Suppose, however, that she has found a man who understands the situation, and they have agreed to marry and both continue working until they have paid off their debts. Then they suffer from the fear of an unexpected pregnancy, and not without reason. In Mrs. Chase Going Woodhouse's study of successful marriages among highly educated people,<sup>185</sup> she found that unexpected children appeared in 30% of the homes. On the other hand, where childbearing is successfully postponed, by the time such a woman plans her first pregnancy her biological fertility will in a considerable proportion of cases have begun to wane. She may find, to her sorrow, that the hoped-for children do not appear.

This situation is much the same, in principle, for men. But *a man is perhaps a little less hesitant to discuss marriage with a girl*, while he is still encumbered with debts. Perhaps, too, he is less conscientious about paying them off. A philanthropist who has for 30 years been making personal loans to college students, tells us that a number of men have defaulted on payments to him, but never yet a woman.

Of course, an occasional borrowing of a few hundred dollars to carry one over a shortage, when means of paying it back later are in sight, is legitimate financing either inside or outside of college. We are not talking about the relief of a temporary emergency, but of the custom of letting people go into debt for a substantial part of their education, and thinking that this is doing them a favor. From a social point of view, we believe colleges should strive to convert all scholarship loan funds to scholarship funds not administered as loans un-

less it can be shown affirmatively, by publication of the records, that the system has not done harm in the way mentioned.

Some of the students who have been financed through college in this way should not have been encouraged to proceed beyond high school. Others are of sufficient value to the community to justify scholarships which will leave them equipped at graduation to begin to make the fullest possible return to society. These returns on the average are not more worth while than marriage and parenthood would be.

The marriage records of American colleges have in most cases improved slightly since the World War. In part this reflects the general increase in the marriage rate and in part the lowering of the age of marriage. To a large extent it reflects the larger enrollments of colleges, now made up of a more representative group of young people. To some extent it reflects the fact that many colleges, particularly the separate colleges for women, have been on the defensive so long in this respect, that the pressure of opinion of their graduates is slowly forcing changes, as older members of the faculty and administration die off and younger, more normal, and more socially-minded ones take their places. Thus the difference between the marriage rates of alumnae of separate colleges and of co-educational institutions is being cut down in most states. And all are marrying sooner after graduation—mostly three or four years afterward.<sup>50</sup>

These changes have been reinforced by the change in general social attitude in passing from the Victorian to the present time. While on the one hand modern women tend less to look upon marriage as a solution of all their problems, on the other hand it is perhaps more attractive to them, because of a better recognition of the values it has to offer, and a changed attitude toward sex.

Many colleges, trying to justify themselves, have pleaded that at least the marriage rate of their graduates was no worse than that of the sisters, cousins, and aunts of these graduates—that is, other women from the same socio-economical levels.

Even were this true, the college graduates do not marry as soon.<sup>16</sup> Usually they marry a couple of years later than their relatives. The effect of this, not merely on the birth-rate but also on the length of generations, which has a similar biological result, is too often neglected. While much has been said about the dysgenic effects of celibacy among educated women, it is quite possible that the common delay in marriage is even more dysgenic.

But merely to expect that education will not lower the marriage rate, is not enough. Surely any institution or profession that attracts a more able part of the population at a critical time in the individual's life, and does not furnish these individuals with a better, rather than a worse, opportunity than the average to marry successfully, is disappointing. Unless a college education definitely improves a girl's chances of marriage, the college is falling short of that contribution to human welfare which its founders and endowers are justified in expecting.

To expect such a service is not unreasonable, because there are so many favoring conditions. Young people are here thrown with large numbers of their own kind and age, and while most of them will not pick out husbands and wives during their undergraduate days, many of them will later marry those with whom they become acquainted in school. After their formal education is finished, and they go out into the world, they have no such favorable opportunity to meet large numbers of like-minded young people of the opposite sex. Often they have almost no opportunity.

To devise community machinery for promoting acquaintance and giving unmarried young people once out of school a normal social life is extremely difficult, yet a task that calls for effort.

Wherever there is inadequate opportunity for marriageable young people to meet, necessity tends to bring into existence intermediary agencies. This lack of opportunity may be due to geographical isolation, where homes are scattered far apart as on the plains of Western Canada; to the segregation of women, as among Muhammadans and some other Oriental peoples;

or to the fixing of special qualifications, as among ghetto Jews. But in most modern civilized countries, this lack of opportunity is due to the inadequacy of social machinery at this point.

In Germany since the World War, there has been an enormous increase of matrimonial advertising in newspapers by the principals themselves. To illustrate the scale of this, it was found in Wurttemberg that in a year when 40,000 marriage licenses were issued, matrimonial advertisements were published by 10,000 different people.

Direct advertising is not an approved American standard and its place has been taken by commercial agencies that act as middlemen. *These fall into three general classes; social clubs, which may be either limited or unlimited in membership; agents who make private introductions (there are also some clubs that are combinations of these two features), and correspondence clubs.*

Several investigations have shown that none of these agencies adequately meets eugenic needs. The social organizations (Lonesome Clubs, Get-Acquainted Societies, and the like) reach for the most part a middle-aged or elderly group, to whom they furnish some social and recreational opportunities, but even if the members marry they are largely past the age of reproduction. The agencies of private introduction serve only a limited number of persons, and it is difficult to check on their actual success. The best known are the so-called marriage brokers among orthodox Jews in large cities, particularly in New York. Parents who are anxious about the marriage of their children consult such a broker, whose advertisements appear regularly in the Yiddish press. This man or woman checks up on the lists and describes the most promising prospects. The young man telephones or writes the girls whose names are given him, stating that he has been told to do so by the go-between, and asking if he may call. He then does so, is looked over by the girl and her parents, and if both sides are satisfied, the acquaintance is continued and allowed to mature if it will.

The correspondence clubs operate similarly, except that

the whole transaction takes place by mail. Lists of each sex are published. For a small fee, usually only a dollar or two, an applicant is given the names, addresses, and supposed descriptions of persons of the opposite sex who meet certain stipulated qualifications. He then writes, and the two follow up the correspondence, if and as desired. Most of the patrons are the female sex—a recent investigator calculated that at any one time at least 100,000 women are on the lists of these bureaux. Many are widows or divorcees, and they are mostly isolated as by living on farms, or else have little education or social advantage. The number of men listed is usually inadequate.

Without going into detail, certain general conclusions emerge from the study of these commercial matrimonial agencies.

1. There is a need, widely felt, for greater facilities for furthering acquaintance among those desiring to marry.

2. This need is not adequately met.

3. It is felt by women more than by men because of their socially-imposed more passive rôle in courtship.

4. It is felt by women who have been previously married, quite as much as by the unmarried.

5. The great eugenic lack of all such agencies, and an almost inescapable shortcoming, is the lack of any way by which the client can learn about the background of the people he meets.

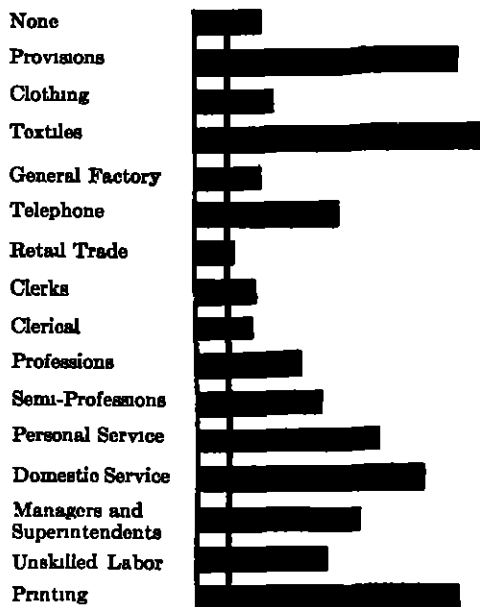
6. There is need for positive assistance and counsel to such people, as well as mere opportunity for acquaintance.

7. For obvious psychological reasons, such agencies should have other objects, and the introduction of people who wish to marry should be a secondary and incidental feature.

Since most men and a majority of women in cities are gainfully employed prior to marriage, business contacts form one of the main sources—for many, almost the only source—of social contacts that may lead to marriage. These may be contacts resulting from work together, or from a meeting in the course of some business transaction. The former is a source of many marriages, the number depending on the relative numbers of unmarried men and unmarried women employed. In a study



of 49,000 marriages in Philadelphia, it was found that the proportion of marriages between persons engaged in the same occu-



OCCUPATIONAL PROPINQUITY AND MARRIAGE

FIG 34 —If marriage selection were a matter of chance, women in any occupation would marry men in that occupation in proportion to the total number employed. Thus if one-half of all men were employed in manufactures, it would be found that one-half of the women employed in manufactures would marry such men, and so would one-half of the women employed in offices, in teaching, and so on. This unity of expectation is shown in the vertical line running from top to bottom of the graph. In all cases (based on 50,000 marriage licenses in Philadelphia) expectation is exceeded—in several instances by more than 500%. Under urban conditions, the opportunity to meet people who are in one's own type of work is evidently a very strong factor in sexual selection. After Donald M. Marvin

pation was two or three times as great as chance would demand.<sup>97</sup> Figure 34 shows some of the results graphically.

The choice of a vocation, therefore, not only determines in many instances whether a woman will marry at all, but also

what kind of a man she will marry. The results are due in part to propinquity and also to the selection of mates with similar qualifications, tastes, and habits.

No adequate studies have been made of the marriage rate of various occupations open to educated women. In a general way it is believed that the marriage rates of any of the favored occupations, such as teaching, nursing, social service, and library work, are low. The census of 1930 gave the numbers of men and women in these occupations as follows:

<i>Occupation</i>	<i>Men</i>	<i>Women</i>	<i>Total</i>
Teachers (gymnasium, dancing, etc.)	5,667	4,034	9,711
Teachers (school)	116,848	635,207	752,055
Librarians	1,795	13,502	15,297
Nurses	5,464	143,664	149,128
Religious, charity, and welfare workers	14,151	26,927	41,078

Evidently the shortage of men in these professions is a serious handicap to the marriage of the similarly occupied women.

Studies of the graduates of a dozen nurses' training schools have shown that only about one-half ever marry.<sup>118</sup> Yet nurses are not only a selected group, but they have had an education which would fit them better than most women for motherhood. A few may be deterred as the result of unfortunate experience in witnessing painful scenes during their training, but it seems probable that a defective social life is the main factor. Their hours of work, both during and after training, are irregular and little provision is made for a normal social life. Moreover, hospital nurses have little contact with the group of men of whom they see most, namely, the medical staffs of the hospitals, who are for the most part married. It seems likely that the semi-conventual life of hospital nurses could be modified successfully to give them more of a social outlet, without impairing either their own efficiency or the discipline of the hospitals.

Since there are no adequate studies of the marriage rates of women engaged in the various professions that are most frequented by educated women, 100 women graduate students

undertook to list in order those occupations which they considered furnished the most favorable opportunities for marriage.

The 13 occupations which were mentioned most frequently are given herewith, in the order of their supposed tendency to favor marriage. Nearly all of these were also listed in a recent study <sup>100</sup> in which large numbers of educated people were asked to rank women's occupations in the order of their presumed social status or honorific value.\* The ranks of these 13 occupations in the study last named are, therefore, appended for comparison. It will be noted that some of the occupations which are thought to be most reputable are also thought to furnish the least likelihood of marriage. In fact, the correlation between rank order in the two lists is — 72, showing that there is a tendency, in general, for the most reputable professions to be the least marriageable.

These categories are of course very general, and much subdivision would be necessary in accurate study. In a Wisconsin investigation, for instance, it was found that high school teachers of home economics had the best marriage rate in the teaching profession, elementary school teachers next, and other high school teachers lowest.

<i>Occupation</i>	<i>Rank in Favoring Marriage</i>	<i>Rank in Giving Repute or Social Status</i>
Stenographer	1	12
Actress	2	11
Private secretary	3	4
Journalist	4	8
Buyer (dep't store)	5	7
Nurse	6	6
Saleswoman	7	13
Physician	8	1
Social worker	9	9
Librarian	10	10
Lawyer	11	2
Research or laboratory technician	12	5
Teacher	13	3

\*The rank given to home-maker in the original list of 33 occupations is interesting. On the whole it fell just about the middle. But the men who ranked the occupations tended to put it near the top, while the younger women put it at or near the bottom. Is this an indication of the effect on young women of contemporary high school and college education?

Of the women whose names appeared in *Who's Who in America* (1926-1927), 53% had been married, the educators having the lowest percentage of married, and the social workers the highest.<sup>18</sup> The average age at marriage was 27 years, with educators again having the highest average. The group in *Who's Who* married on the average one year later than college women and three years later than non-college women of equivalent social standing. Of the married women, 36% have husbands who are in *Who's Who* and of these 27% are in the same profession as their wives. This again points to the importance of occupational propinquity.

Employers and industries in many instances can do something to improve the social lives of their forces. Meanwhile, the whole problem of helping young people to meet, after they leave school, requires more careful consideration from all thoughtful people.

The problem is partly one of reorienting society so as to make a normal social life, and normal marriage, seem important. The problem is partly one of leading the public to a different attitude toward, and different ways of using, leisure time. This includes giving more adequate training for play as well as work. The problem is partly biological, the difference between introvert and extravert temperaments, and between social and abstract intelligence. It involves a study of the whole psychology of social relations between young people, now largely unknown. It means beginning in childhood with better mental hygiene. The whole subject demands a different attitude and more cooperative action on the part of schools and colleges, as already mentioned.

Of community organizations that could aid, the church comes to mind at once, because in an earlier period it played an important part in this respect. Its contribution is discussed more fully in Chapter XIII.

In general, both the church and other community organizations must make more of an effort to get young people into doing things together, not merely into playing together. In no other way can they get acquainted so well.

More professional bi-sexual clubs with inexpensive junior memberships would help to bring like-minded persons together, and that is the basis of successful marriage. College alumni and alumnae in particular might be sought out and encouraged to renew or form acquaintances.

Community playground and recreation centers are developed almost wholly on segregation of the sexes, or else for the whole family, as in Los Angeles where the slogan is, "The family that plays together stays together." While the latter policy is admirable, it leaves little room for the young person who has no family but would like to have one. With cautious and tactful management on the part of recreational directors, far more might be done for the unmarried. The same sorts of clubs and groups mentioned as desirable in high school and college life could be formed here. Music, drama, art, nature, hiking, and the like can easily bring young people of congenial tastes together. Freer use should be made of schools and community buildings.

It is often said that the rapid growth of evening classes and of adult extension education is due largely to the hope of those who attend that in this way they will be able to make new acquaintances.

Many existing agencies could cooperate to advantage. The present monastic organization of the Y.M.C.A. and Y.W.C.A. is an anachronism, and is gradually breaking down as younger leaders come into control. The experience of the Pittsburgh Y.M.H.A. and Y.W.H.A. in their joint building, and in their activities, which are also largely joint, is encouraging, as well as that of International House at Columbia University. If a merger is not attainable, such an arrangement as that made by the Y.M.C.A. and Y.W.C.A. at New Haven, Conn., may serve as a compromise. Here the two organizations have put up buildings side by side, with a connecting building that serves as a common meeting place for both sexes and contains the social rooms and cafeteria. In a number of other cities, the two organizations have also worked out coöperative projects,

the success of which seems to show that there is no insuperable objection to a closer relation between them.

The same idea could be worked out in providing housing facilities in cities for clubs. The National Arts Club of New York City might be a model for less ambitious establishments elsewhere. Let the Y.M.C.A. and Y.W.C.A., or a downtown church, or an alumni organization, organize a residence club in which invitations are issued after due investigation. A man and his wife, acting as host and hostess, would make a real effort to help their guests to have a normal social life. The Lakeside Quadrangle at the University of Wisconsin summer school operates in an analogous way without serious difficulty.

Finally, at the present time perhaps as much can be accomplished by the socially-minded individual as by anyone else, if he will open his home to the young people of his acquaintance and deliberately help them to widen their circles of acquaintance.

## CHAPTER XV

### THE IMPROVEMENT OF REPRODUCTIVE SELECTION

#### 2. FECUNDAL

To make progress, a population must reproduce itself more from the able part of the population than from that lacking in ability. Reasons have already been given for thinking that this prerequisite is no longer fulfilled in the United States or in most other civilized countries. To regain a proper balance, the birth-rate of less effective parts of the population may be reduced, and that of more effective parts of the population may be increased. Measures for gaining the reduction needed have been given, particularly in Chapters VIII, IX, and X. In this chapter we shall consider ways of improving the birth-rate of the part of the population that can, on the whole, contribute eugenically valuable offspring.

This, it may be said at once, comprises the larger part of the whole population. A sound eugenic program must be based not on any limited stratum of society, but on the bulk of the population, for two reasons. In the first place, their numbers are such that the population can not be kept going without them; in the second place, the valuable genes of the whole population are distributed widely among them. While the highest intellectual levels contain the most favorable combinations of genes, and therefore should be conserved, the reservoir that is formed by the bulk of the population can not be neglected.

The eugenically effective part of the population may therefore be defined as made up of those persons who have the germinal bases of the following characteristics: to live past maturity, to reproduce adequately, to live happily, and to make contributions to the productivity, happiness, and progress of the species.

The problem of fecundal selection is to get from this part of the population a birth-rate adequate to keep the whole group at an optimum size. Mere instinct is no longer sufficient for this purpose. It has never been sufficient in any civilized society, for the competition of other interests and the imposition of a variety of burdens leads people to cut down the number of their children below the level of replacement, and in many cases to forego parenthood altogether. The problem, then, is a double one. First, parenthood must be made attractive enough, in social repute, to lead people to want to be parents. Second, the hindrances that stand in the way of gratifying a desire to be parents must be eliminated, reduced, or compensated.

The first is a problem of education, broadly speaking. Most of the educational forces of the community, both in the formal school system and those that operate through the many other channels that form public opinion, must be oriented along sound biological lines. For convenience, a number of stages may be distinguished.

- 1 In the home. The adult's attitudes toward marriage and family life are largely conditioned during the first five or six years of life, even before he goes to kindergarten. Patterns of disharmony or excessive emotional attachment to or aversion from one or the other parent may lead in later years to avoidance of or failure in marriage. Memories of an unhappy and overcrowded home where every new baby was an unwelcome burden have prevented many people from having families of their own. On the other hand, the spoiled child may fail in marriage or parenthood because determined always to have his own way—a fatal handicap to teamwork. The whole process of education for marriage and parenthood therefore produces favorable results in the next generation, and aids in breaking a vicious circle that now exists. Observation indicates that the most important factors in the child's adjustment at this early period, making for his own success as a parent in the future, are the adequate satisfaction of his need for (1) security



and affection (ii) growth and development (iii) understanding of his own limitations and capabilities (iv) understanding of death, religion, and the idea of God (v) understanding of the ideas of power and authority, and (vi) understanding of sex. The home that meets these requirements for its children is preparing effective parents for the future.

2. In the elementary schools the child should get an increased understanding of heredity and reproduction through nature study. This has been done with great success in the third and fourth grades. He should further be kept family-minded, through a closer tie-up of the school with the home, and through the employment as teachers of a larger proportion of mature married women who have successfully brought up children of their own. The school can not be expected to develop a child's inherited possibilities unless it knows what those possibilities are. Often they can not be understood without a knowledge of his home and family. Yet the break between home and school tends continually to become wider rather than narrower. Many parents do not visit the classes in which their children are being taught, and frequently do not even know the teacher by sight, much less invite her into their homes so that she may understand the children better by knowing their background. Moreover, the idea of the family should be kept before the child by an integration in the curriculum. At present it is almost excluded. The child may learn something about the home life of the Eskimos (or in a later grade about that of the Greeks and Romans) but little reference is made to the home life of Americans. Experience will gradually develop techniques for getting much of the education for marriage and parenthood into the elementary schools. This is necessary because half of the population goes no farther than the eighth grade, and only one-eighth goes far enough to graduate from a standard high school.

3. In the high school period (the ninth to twelfth grades or, if the junior high school organization is adopted, the seventh to tenth grades) the schools should undertake definitely to provide information and attitudes necessary to future success in

marriage and parenthood. If they do not do so at this age level, they can not do so at all in most cases, because the students will be dropping out of the schools to go to work, or to marry. Problems of relations between the sexes should be dealt with here, together with the necessary fundamental ideas about the basis of choice of a mate, the basis of marriage and the family, the use of leisure time, the technique of home-making, and even the care of children.

Most of this material can be integrated in present courses, without requiring any administrative changes. The main limitation is one of personnel. Where a well-informed and well-adjusted teacher is found, much of this material can be presented successfully as part of almost any course, whether it be history, civics, sociology, physical education, psychology, art, natural science, English or foreign literature. A special part is being played by home economics which during the last decade has broadened out from a somewhat narrow specialty dealing with the techniques and skills of housekeeping, to attempt a broad, fundamental education for marriage and family life. Home economics courses all over the United States are being thrown open to boys, frequently under such a disguise as "Social Arts" (which correlates with Social Science), or "Family Relationships." The whole burden should not be thrown on the home economics department, however. If marriage and parenthood are discussed as a normal and natural part of almost every course, with no false emphasis and no overemphasis, they will be likely to assume their proper place in the minds of the students. The latter will, in particular, get a more correct idea of what marriage and parenthood mean to the individual personally, as well as to the race. Lack of a correct understanding on this point leads, on the one hand, to a fantastically romantic point of view that is the basis of many broken homes, on the other hand to celibacy, directly or more often indirectly following entry on a sterile career and a course of life which acts quite unexpectedly, to prevent marriage, to the later deep regret of the individual.

4. In the colleges and universities (and to a large extent in the upper years of the high schools) this policy can be continued. It is not a question of creating special courses, so much as of making each existing course assume its fair share of responsibility for real education, and not arbitrarily exclude consideration of problems that are of the greatest importance to the student. Courses in personal relations should be given not later than the freshman year in colleges, because the students are then most likely to need guidance, being often away from home influence for the first time, thrown on their own responsibility, enjoying an unaccustomed amount of freedom, facing a growing sex-consciousness, and required to make many choices between conflicting objectives.

Since the colleges get a highly selected part of the population, they are under particular obligation to promote its eugenic welfare. That it is a superior group, is manifest from a number of facts:

(a) They have survived the weeding-out process of grammar and high school, and the repeated elimination by examinations in college.

(b) They have persevered, after those with less mental ability have grown tired of the strain and have voluntarily dropped out.

(c) Some have even forced their way to college against great obstacles, because attracted by the opportunities it offers them for mental activity.

(d) Some have gone to college because their excellence has been discovered by teachers or others who have strongly urged it.

All these attributes are not wholly acquired, but in some degree inherent. Furthermore, the students are not only superior in themselves, but are ordinarily from superior parents, because

(a) Their parents have in most cases coöperated by desiring this higher education for their daughters and sons.

(b) The parents have in most cases had sufficient economic efficiency to be able to afford a college course for these children.

Before they leave college, the students should certainly have received the following equipment:

(a) They should have learned how to deal successfully with their own developing sexuality.

(b) They should have an understanding of sex-differentiation, lack of which understanding is a frequent cause of sex-antagonism, failure to marry, or failure to make a success of marriage, with a likelihood of childlessness in either case.

(c) They should have learned how to make themselves personally attractive, particularly to the opposite sex. Lack of this knowledge results in too much striving for flashiness and vivacity; it results in introversion and anti-social attitudes; it also results, through overcompensation, in excessive attempts to capitalize sex appeal, by those who have the universal desire to attract attention but doubt whether they have any other appeal to make.

(d) They should have made a wide circle of acquaintances among the opposite sex.

(e) They should have acquired through biology courses or elsewhere an active interest in heredity and eugenics, including on the one hand a real grasp of the idea of "terrestrial immortality" through the continuity of the germ-plasm, and on the other hand a feeling of the importance of perpetuation of the species from its fit rather than from its unfit members.

(f) They should have an understanding of the place of the family in society, from a historical and an evolutionary point of view, but with special reference to its present-day problems. For this purpose the student should be forced to reappraise all his traditional ideas regarding sex and to find their rational foundations, in order that he may not make the mistake of supposing the fundamental, biological needs of evolution to be merely arbitrary tabus or crafty schemes devised by those in authority to subjugate him for their own purposes.

(g) They should have acquired much of the basic technical training needed to make a success of family life, including much of the knowledge needed for the solution of daily problems

whether these are in the emotional or the economic realm, whether they have to do with making a living or caring for children. In so far as they do not get this detailed technical training, they should know that it is needed and know where they can find it, later on when they do want it.

(h) They should have attained emotional maturity. This involves a breaking away from infantile emotional ties with one's own family, the achievement of self-support or at least its possibility, a heterosexual outlook on life, ability to recognize realities in terms of what they are, stripped of all infantile symbolism, and ability to act according to these realities without compulsions of an emotional nature, ability to adjust to an intolerable situation with a minimum of conflict, and, finally, the formulation and adoption of some kind of a philosophy of life. This emotional preparation, as evidenced by maturity or the attainment of adult stature, is largely neglected in educational institutions, but it is quite as important for successful parenthood as the possession of mere technical knowledge—more so, in fact, for the latter can be acquired rapidly by an intelligent person, while the youth who has grown to adult years but is still living at an infantile or adolescent level emotionally may be quite helpless to remedy his own defects, and may not be fortunate enough to find when needed a teacher who will enable him to pass over these limitations.

Since the greatest eugenic wastage at the present time is among college-educated women, these need particular help to orient themselves. Here a wise selection of teachers is particularly important, to avoid those with a narrow or warped outlook on life. Not only should a distorted type of education be avoided, but the educated woman should derive from her course abundant help to make motherhood fit in with successful self-expression in other lines. The qualifications, advantages, and possibilities of motherhood should receive no less attention than those given to pedagogy, library work, or social service, and the opportunities it provides for full self-realization should be shown. Some of the rewards of parenthood can

scarcely be gained elsewhere; a college woman <sup>11</sup> has enumerated them as follows:

(a) The care of one's children makes for greater efficiency by giving an incentive with more driving power than the mother has ever before known.

(b) It gives an abiding sense that one is engaged in creative work.

(c) It gives a sense of being linked to the future.

(d) It provides self-discipline which allows the individual to use her intelligence instead of being fuddled by every stray impulse.

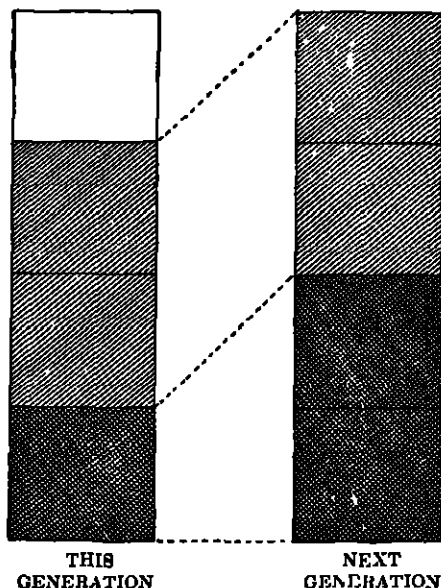
(e) It brings the sense of maturity which comes with knowing that one belongs to the great biologic stream of adults fostering the young. Thus it provides a race-consciousness or species-consciousness that avoids the sense of isolation and loneliness which is associated with excessive individualism.

5 After the end of schooling, whether this be at the termination of the sixth grade or with the reception of the Ph.D. degree, there should still be abundant community facilities for education, to meet the needs of parents. The evening high school and university extension courses that have been so popular during the past decade might well give more attention to marriage and the family. The formal Adult Education movement, which has so far tended to concern itself largely with problems either of economics or of esthetics, should aid its clientele more definitely with their family problems. Men's and women's clubs and parent-teacher organizations should particularly try to deal with the constructive side of family life, in order to provide for the children of these adults the right kind of surroundings in which to develop. The opportunities of the church have been described in Chapter XIII. Finally, there should be in every large community centers in which individual problems can be met by the provision of all the resources of science, as is done by the Institute of Family Relations in Los Angeles, and by many agencies of various kind elsewhere.

Such a shift in emphasis of education as has been outlined would do much to change public opinion toward parenthood. At present the influence of some of the principal agencies which mould public opinion is unfavorable to marriage and family life. Motion pictures, newspapers, novels, magazines, dramas, popular songs, all tend to represent marriage in an unfavorable light, to emphasize disruptive and anti-social tendencies, to depreciate parenthood, and frequently to make parenthood appear undesirable, not to say vulgar. This pressure of public opinion has an insidious influence, even on young children. Girls in the elementary schools in three large southern cities were asked what person in past or present history they would rather be. The largest number said they would like to change places with George Washington, the second largest number with a moving picture actress who was just at that time achieving notoriety, not for histrionic ability so much as because of a spectacular and disintegrated sexual life. Evidently, an educational system that permits, and public opinion that leads, young girls to have these ideals is not meeting its responsibilities in preparing them for parenthood in the future.

In exalting motherhood there is of course need for discrimination. Not all motherhood is worthy of admiration. One of the evil indirect effects of the contemporary movement to protect *unmarried* mothers and remove the handicaps of illegitimacy has been a tendency to place all motherhood on the same level. Some motherhood should be admired and praised, other motherhood should be reprobated. Beyond this, it would be desirable, in the interests of family conservation, to shift the emphasis from motherhood to parenthood in general. "Mother's Day" should have started out as "Parent's Day." The survival of the Madonna tradition in art has made fatherhood disregarded if not depreciated, and has perhaps also placed a premium on one-child families. Certainly those who attempt to find any great pictorial art portraying a normal family of father, mother, and three or four children will look long, and probably in vain.

Popularity of the study of genealogy is undoubtedly of value in giving a sense of family continuity. This is particularly to be encouraged when the study is based on broad and sound



THE CHANGING GENERATIONS

FIG 35—In civilized countries, one-fourth of this generation produces one-half of the next, while another one-fourth of this generation contributes nothing to the next. The remaining two-fourths of this generation make up the other half of the next generation. The composition of the next generation will therefore be influenced tremendously by the composition of the four quarters which are thus differentiated as to fecundity. (The proportions here shown are of course only approximate.)

biological principles, and is not a mere invidious accessory to snobbishness.

Since the problem of eugenics is not so much that of getting parents to have a child or two, as it is that of getting them to have a family adequate in size to spread their talent—at least four children in superior stocks—the question why people go on to have a third or fourth child, after having had two, is an



important one to answer.<sup>64</sup> Inquiry on this point from many parents showed that next to the satisfaction of those deep-seated feelings which are classified, not too accurately, as "parental instinct," the most frequent reason for the bearing of an extra child was the inadequacy of a set of children all of one sex. Parents of girls are determined not to stop until they get a boy; parents of boys are not satisfied until they also have a girl. One of the common causes of the two-child family is that, one of these being a boy and the other a girl, the parents are satisfied to have no more. Desire to have children of both sexes therefore leads to the birth of more children than would otherwise be born, but it is not a strong enough motive to produce an adequate birth-rate.

Other causes alleged as having led to the production of extra children are desire for the children to have sufficient playmates, pride in the children already born and desire to follow up this successful start, desire to perpetuate and spread the family name, and sometimes religious motives. Occasionally a mother avers that her bearing of children is largely due to her admiration of her husband and her desire to give the world more men like him; once in a while she explains it as due partly to curiosity as to what the next child would be like. All of these influences are doubtless negligible as compared with the general and age-long experience of the normal satisfactions of family life. History is full of regrets expressed in old age by men who had sought fame or fortune and felt that their years had been misspent. We can not recall ever having heard of a man who, after bringing up successfully a family of superior children, expressed regret over a waste of opportunities.

While there is doubtless variation in the strength of parental feelings as in everything else, it is probable that natural selection has tended to maintain this characteristic at a fairly high level, and that if people are not subjected to harmful emotional influences and the wrong kind of an education, the normal part of the population will desire a reasonable number of children, provided too many obstacles are not put in the way of realizing

this desire. The second essential in the improvement of fecundal selection is to scrutinize the institutions and customs of civilized society, to find what ones are hindering the bearing of children in normal families, and to remove them or offset their action in some way. These hindrances may be grouped under half a dozen heads.

1. Economic. Many superior parents would have more children if they felt they could afford it. This hindrance is often a mere rationalization—a defense of selfishness or a justification of unjustifiable standards of expenditure. But at the best it is a real factor for almost every educated family. It is felt in a number of ways:

(a) It costs more to clothe children than it used to. Not only does clothing of a given quality cost more now than it did a few decades ago, but there are more fabrics and designs available, and many of these, while attractive, are costly and not durable. Compliance to fashion has increasingly made itself felt in the clothing of the child.

(b) It costs more to feed them than it used to. Not only has food for every one increased in price, but the standards for feeding children have been raised. Once children were expected to be content with plain fare, now it is more frequently the custom to give them just what the rest of the family eats.

(c) The cost of medical attention has increased. All demand more of the doctors now than they did in the last generation. The doctors are able to do more than they formerly could and parents discriminate more in the selection of medical service, especially in the wide use of specialists. Hence medical attendance for a child is constantly becoming more costly, because more frequent; and further, the amount of money which parents spend on medical attendance for their children usually increases with any increase in their income.

(d) The cost of domestic labor is greater. Most kinds of domestic service have more than doubled in price within a generation. Moreover, it is gradually being realized that a high

standard is desirable in selecting a nurse for children. As a fact, a children's nurse ought to have much greater qualifications than the nurse whose duty is to care for sick adults. If a mother is obliged to delegate part of the work of bringing up her children to some other woman, she is beginning to recognize that this substitute should have superior ability. While doubtless there is among some of the behaviorists an exaggeration of the plasticity of the child, their writings have aided in this effect. Ignorant nursemaids are less willingly tolerated, and as the number of competent assistants for mothers is very small, the cost is correspondingly high. An increase in the number of persons trained for such work is to be anticipated, but it is likely that the demand for them will grow even more rapidly; hence there is no reason to expect that competent domestic help will become any less costly than it is now.

(e) The standards of education have risen steadily. There is perhaps no other feature which has tended more to limit families. Conscientious parents have often determined to have no more children than they could afford to educate in the best possible way. This meant at least a college education, and frequently has led to one- and two-child families. It is a motive of birth control which calls for condemnation. The old idea of valuable mental discipline for all kinds of mental work to be gained from protracted, difficult, formal education is now rejected by educational psychologists, but its prevalence in the popular mind serves to make "higher education" still something of a fetish, from which marvelous results, not capable of precise comprehension, are anticipated. We do not disparage the value of a college education, in saying that parents should not attach such importance to it as to lead them to limit their family to the number to whom they can give 16 to 20 years of schooling.

The effect of these various factors in the increasing cost of children is to decrease fecundity not so much on the basis of income of parents, as on the basis of their standards. The prudent, conscientious parent is therefore the one most affected,

and the reduction in births is greatest in that class, where eugenisists are most loath to see it.

The main remedy appears to be a change in public opinion which will result in a truer idea of values. In this respect there is room for a great improvement in contemporary ethics. Some readjustments in family budgets are called for, which will discriminate more clearly between expenditure that is worth while, and that which is not. Without depriving his children of the best medical attention and education, one may eliminate those invidious sources of expense which benefit neither the children nor anyone else—overdressing, for instance. A simplification of life would not only enable superior people to have larger families, but would often be an advantage to the children already born.

Parenthetically, the fact that higher standards in a population lead to fewer children suggests a valuable means of reducing the birth-rate of the inferior. Raise their low standards of living and they will reduce their own fertility voluntarily (contraception furnishing them with the possibility). All educational work in the slums therefore is likely to have a valuable though indirect eugenic outcome. The poor foreign-speaking areas in large cities, where immigrants live huddled together in squalor, should be broken up. As these people are given new ideas of comfort, and as their children are educated in American ways of living, there is every reason to expect a decline in their birth-rate, similar to that which has taken place among the native-born during the past generation.

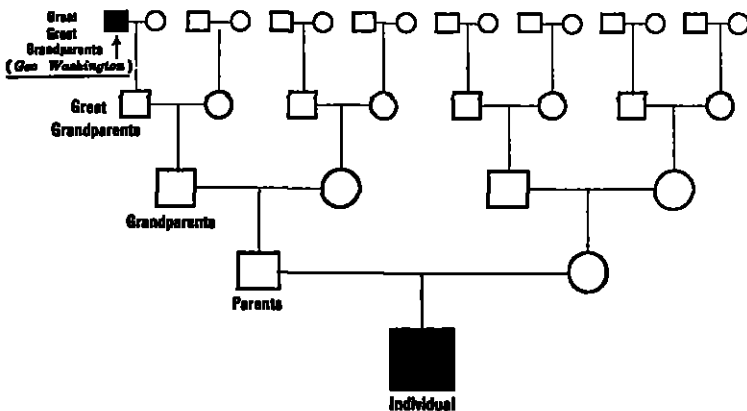
This elevation of standards in the lower levels will be accomplished without any particular exertion from eugenics; there are many agencies at work in this field, although they rarely realize the result of their work which we have just pointed out. But to effect a discriminating change in the standards of the more intelligent and better educated levels calls for a real effort on the part of all those who have the welfare of society at heart. Possibly the influence of public education will make itself felt in time.

Most of the studies on family life during the last generation have been of broken homes or abnormal families. It would be highly desirable to study more successful, and particularly more large and successful, families, to find out how they have solved their own problems.

Various attempts have been made to aid families in the four principal items of expense: housing, medical care, domestic help, and education. But it is extremely difficult to plan any method of giving direct help which does not attract people in the lower levels rather than the upper levels of social and economic status and therefore work dysgenically. A Roman Catholic organization in Chicago announced that it would meet, for its members, all the expenses of childbirth, for a flat fee of \$50. This covered medical care, delivery, two weeks in the hospital for the mother, and an attendant in the home to take care of the other children for the two weeks during which their mother was at the hospital. Such an offer, although a good piece of charity, is evidently not likely to be eugenic, and the same objection may be urged against the various types of "baby bounty" or "maternity benefit" that have been advocated and in some places tried. Such methods are almost inevitably political in their application, and it is doubtful if any far-reaching eugenic results can be gained by any method that is dependent upon politics.

Something more could be done to relieve the cost of education of superior children, by the system of competitive scholarships. Great Britain has gone farther in this direction than has America, and apparently with good results. In the United States the aid given to students is too often in the form of loans rather than scholarships, and too often administered as a charity, being intended not for the particularly able so much as for the "worthy poor." To be most eugenic, any help of this sort ought to be selective, competitive, and progressive.<sup>124</sup> It has in the past been suggested that universities might well charge tuition on the basis of the student's ability, as demonstrated by mental and other tests. The superior student should

be taught free, as likely to make the greatest return to society for this gift. Men and women of ordinary ability should be charged an ordinary tuition, while the dullard, who is sent by his parents merely to get for four years the advantages of what one psychologist called "the combination of a country club and detention hospital," should be obliged to pay two or three times the regular tuition, in order to compensate for the free education of those who can really profit by what is of-



THE SMALL VALUE OF A REMOTE ANCESTOR

FIG 36.—A living individual who was a lineal descendant of George Washington might well take pride in the fact, but genetically that fact might be of very little significance. The above chart shows graphically how small a part any one ancestor plays, a few generations back. A general high average of ability in an ancestry is much more important, eugenically, than the sporadic appearance of a distinguished individual.

fered them. Perhaps such proposals have not been intended altogether seriously, but they contain food for thought.

In many individual cases the best remedy for the situation is help from parents who are abundantly able to give it. There is a widespread tradition that a son should never marry until he is economically independent. This is not justified, for when a young man's training in most of the professions is necessarily extended over so many years, that of the medical student

for instance for eight or ten years, it is impossible for him to achieve economic independence until after he is established. In such cases, parents who are able and willing to help him marry, deserve hearty approval.

The argument that such help would undermine the initiative of the son has not been borne out in our observation, except where the subsidizing is continued unnecessarily long. Many parents, however, take a curious position of willingness to pay for a child's education, no matter how long continued or useless, but determination to withdraw all help the moment he (or she) marries, no matter how useful such help might be.

If such a system of help for young married people (or, what is much the same thing, the continental system of dowries) were made so universal that it had the force of an unwritten law, it might work dysgenically by leading people to reduce the number of their children in order to provide a better dowry or allotment. If, however, it is used individually by families that can afford it, as a means of allowing their children to marry earlier and have children, it seems likely to be wholly eugenic in results.

Professions, businesses, and industries that have made a practice of picking out the ablest young men who graduate from the universities and employing them for several years at a nominal wage, often not more than \$10 a week, on the ground that the honor resulting from their association is sufficient recompense, should realize that this policy is wholly anti-social. Internships for medical graduates, and fellowships in universities, should as soon as possible be put on a basis not merely adequate for self-support but for the support of a wife as well. The provision of some fellowships that the holder must not marry is a survival of monasticism which is now far out of date.

The value of changes in taxation, that will favor superior families (particularly through exemption in income tax), is discussed in Chapter XVIII. Such indirect aid to the family appears to be one of the most feasible methods of giving help.

But a more thoroughgoing and direct aid has been demanded, in the form of a *"family wage," based on the size of family*. The argument, based equally on grounds of eugenics, of economics, and of social justice, is briefly as follows:

At present the catch phrase, "equal pay for equal work," is a delusion because it does not bring about the results intended. If an unmarried man or woman is paid \$3,000 a year as principal of a school, he or she has \$3,000 a year to live on. If the same job is given to a man with a wife and four children, he does not get for the same work \$3,000 a year to live on, but \$3,000 less the cost of supporting his wife and their four children, which makes the result very different. While the face value of the salary check is the same in the two cases, the real wage is entirely different. What is needed is not "equal pay for equal work" in the present sense, but rather "an equal standard of living for equal work." This requires that the real wage be equalized, not the face value of the pay check.

To make such an equalization, society must adopt some calculation as to how much a man's expenses are increased by a wife, and how much their joint expenses are increased by each child. This would require a great deal of investigation, but is entirely feasible. Taking a minimum calculation for the purpose of the present illustration, we assume that a man's cost of living is increased yearly by the amount of 30% of his income when he takes a wife, and by an additional 15% of his income each time they have a child. Then the hypothetical school principal mentioned above, with his wife and four children, needs nearly twice as large a salary to maintain the same standard of living as does the unmarried man or woman who might get the same position, and if the pay is the same in each case, the theory of "equal pay for equal work" is nothing but a grim joke.

What has actually happened in such a case is that society has penalized the man financially when he marries, and penalizes him again, to the extent of 15% of his annual salary, every time he has a child. For every child that he avoids having,



society is in effect paying him a bonus of 15% of his annual salary, "if one contrasts the amount of money he has to spend each year, with that of another man holding a similar job at a similar salary but supporting a wife and several children." With such a premium put on childlessness, is it any wonder that people with reasonably high standards of living keep down the size of their families?

The solution, it is urged, is not to pay people premiums for having children, on the basis of the "baby bounty" but merely to stop paying them premiums for not having children. This could be done by equalizing the real wage or the standard of living, as distinguished from the face value of the pay check; or in other words by increasing a man's salary, on the birth of each child, by an amount approximately equal to the actual cost of that child. Pursuing the hypothetical illustration above adopted, a basal wage of \$1,500, \$2,000, or whatever it might be, would be set for the position of principal of District School No. 35. An unmarried man or woman would receive this salary, a married man or woman with a dependent wife or husband would receive the basal salary plus 30%, and for each minor child the salary would be augmented by 15%. A man with wife and four children might then receive \$3,800 for the same job that would pay a bachelor \$2,000. The two would be able to maintain approximately the same standards of living. The increment with each child would not be great enough to induce anyone to have children "for revenue only" since it would do no more than cover what the man was out of pocket on account of the expenses connected with that child. But it would prevent him from being penalized for gratifying his desire for parenthood, and it would put a stop to the present system in which society is virtually paying him a subsidy for every child whose birth he prevents.

Objections occur readily. It is not correct, for instance, to suppose that the unmarried man or woman never has any dependents. But in principle the argument for the family wage in the above form seems unimpeachable, and its application

would in time do away with most of the grounds for objection. It could be put into effect easily enough, at once, in many lines of activity that are not highly competitive—in the government services, for instance, in the payment of clergymen, and in the remuneration of college professors. It is already being applied in a few universities, and in fixing the scale of salaries in some boards of foreign missions. Its gradual extension in such directions would easily follow on the demand of enlightened public opinion. Its general extension in business and industry would depend on the formation of equalization pools representing all the members of a given industry, so that there would be no temptation on the part of any one member to employ bachelors in preference to family men, in order to get them at lower salaries.

For this purpose, the industries of any given kind, or in any given region, pay into a common fund each week or month an amount equal to their pro rata contribution of the average salaries of all employees in the whole group of industries. They then receive back from this fund the amount they actually pay out to their own employees. Thus if one factory employs only bachelors, it is obliged to pay for some of the family men of the other factories who are parties to the arrangement; while the factory which employs only married men with large families, when its competitors employ bachelors, will have the satisfaction of seeing its competitors pay a considerable part of its payroll. While the arrangement sounds complicated it seems to have worked without difficulty in France and elsewhere.

While the difficulties of a thoroughgoing application of the principle of the family wage in this form are large, from a technical point of view, they are not insuperable. Nor would the cost be an insuperable objection. The expense would depend on the way in which the plan was set up. It might be an expensive bureaucratic project; it might cost not a cent more than is now paid for the same salaries, if the available money were distributed more equitably, with regard for social justice and eugenic necessity. Even if it did involve extra expense, there

is an immense amount of money being wasted annually which, if diverted to productive channels, would be much more than needed to make ample provision for the children of the nation. Among the sources of waste, whose exact size we shall not attempt to calculate, but which in the aggregate amount to tens of billions of dollars each year, are the sums now spent for:

War (past, present, and future) This item alone absorbs two-thirds or three-fourths of the annual revenue of the federal government.

Crime and delinquency

Harmful luxuries such as alcoholic beverages.

Graft and racketeering.

Fraudulent stocks and fake investments.

Dishonest and wasteful construction of buildings and of public improvements.

Spiritualism, fortune telling, and similar superstitions.

Preventable illness (particularly that due to venereal diseases).

Maintenance of insane and feeble-minded persons, either inside or outside of public institutions. While much of this expense is inevitable, it could be reduced materially by a program of negative eugenics

With such sources of revenue available, it is idle to say that a society could not afford to equalize the burdens of parenthood, if it desired to do so. Any attempted equalization must of course be on the basis of percentage increases in basal salary, as above set forth, and not a mere flat rate as is the case with the family wage among industrial workers in most European countries. Such a family wage acts dysgenically because the small amount is more of an inducement to inferior than to superior parents

2. Besides pecuniary burdens, other burdens of childbearing and child-rearing might be lightened by a recognition of the desirability of such relief, and individual or community action. One of the handicaps of the mother who can not afford full-time help in the home is the difficulty of getting away from her

children from time to time. This could be met in many communities by coöperation of a group of mothers, each of whom would care for the children of the whole group one day a week. Organized effort similar to that of the visiting nurse services might make dependable help available to parents of moderate incomes for a few hours whenever needed. It might be possible to establish an apprenticeship system whereby a large number of intelligent young girls at the high school or college level would qualify themselves for management of their own homes by acting as mothers' helpers, at a reasonable salary, in connection with their education, as many are already doing. Schools might find it feasible to establish more day nurseries and supervised playgrounds, as part of their own teaching facilities for home-making. Experiments in this direction in many cities have shown that the pupils, boys as well as girls, heartily welcome such "laboratory facilities." Apartment houses which proudly advertise "valet and maid service" might find a welcome for the advertisement of a child-care service. Hotels and resorts might make more complete preparations for giving their guests some help with the care of children. If all these services were put on a cooperative or self-supporting, not a charitable, basis they would probably work eugenically.

3. Removal of unreasonable restrictions on employment of married women would in many cases enable superior women to gratify a desire for activity outside of the home, as well as for motherhood. Maternity leaves with pay are desirable, and feasible in many non-competitive types of employment, where the idea is by no means new. *Some colleges, for instance, give a woman member of the faculty one-half year with full pay or a full year with half-pay, at the birth of a child.* Said the dean of Barnard College, in reporting on the success of such a policy there, "Our observations have shown that the combination of rearing children and carrying on college teaching is a difficult one, but in some cases certainly very desirable. It is of the greatest importance that our teachers should be normal and interesting human beings, with as full and rich lives as may be

Neither the men nor the women on our staff should be forced into celibacy, or cut off from that great source of experience, of joy, sorrow, and wisdom, which marriage and parenthood offer."

The problem of the teaching profession is a particularly serious one because it involves more than half a million superior young women. On eugenic grounds, preference should in many instances be given to married rather than single teachers, and the single ones should be encouraged to marry. This requires (1) that considerable change be made in the education of young women, so that they shall be fitted for motherhood rather than exclusively for school teaching as is often the case, and (2) that social devices be brought into play to aid them in mating—since undoubtedly a proportion of school teachers are single from the segregating character of their profession, not from choice (3) Provision for employing some women on half-time, and (4) increase of the number of male teachers in high schools. (5) School boards must be brought to see the undesirability of employing only unmarried women, and of discharging them, no matter how efficient, if they marry or have children. The courts must be enabled to uphold woman's right of marriage and motherhood, instead of, as in some cases at present, upholding school boards in their denial of this right. Contracts which prevent women teachers from marrying or discontinuing their work for marriage should be illegal, as contrary to public policy, and talk about the "moral obligation" of normal school graduates to teach in order to repay to the state the cost of their education should be discountenanced.

Against the proposal to employ married school teachers, two objections are urged. It is said (1) that for most women school teaching is merely a temporary occupation, which they take up to pass the few years until they shall have married. To this it may be replied that the hope of marriage too often proves illusory to the young woman who enters on the pedagogical career, because of the lack of opportunities to meet men, and because the nature of her work is not such as to in-

crease her attractiveness to men, nor her fitness for home-making. Pedagogy, like the city, is too often a sterilizing institution, which takes young women who desire to marry and impairs their chance of marriage.

Again it is said (2) that married teachers would lose too much time from their work; that their primary interests would be in their own homes instead of in the school; that they could not teach school without neglecting their own children. The reply obviously is that this is an individual matter and that in the particular case when the teacher is inefficient or does not give full time, she is to be paid less or discharged. It would often be possible to get as teachers mature married women whose children have grown up until they are in school much of the day. These women would have in their own experience of successful motherhood an additional qualification for teaching, and the fact of their success would also furnish another and important means of selecting them.

While experience up to the present is that few women have the ability to combine a full-time job with motherhood to an extent sufficient to replace themselves, and while those who do so, appear to have succeeded in many cases simply by substituting some other woman's time in the home for their own, which may be admirable in individual cases but is of course impossible as a universal policy, there is yet plenty of room for improvement in the conditions under which married women with children are working in careers that demand some intelligence, education, and ability.

4. Better medical care at less expense before, during, and after childbirth would be an advantage in enabling superior mothers to go through pregnancy and parturition without undue risk or burden. Medical authorities agree that both obstetrics and obstetrical nursing are often behind the level of other branches of the professions. Increasing cost of such services has become a serious burden in many families, particularly as this is one point at which the average husband wants his wife to have nothing less than the best. Great attention was

given to this phase of the whole problem by the White House Conference of 1930. In addition to the improvement of the care and service available, progress may be made on the economic side by working out methods of distributing the expense of this care and service over a longer period. Many experiments have already been made in organizing such systems of "paying for babies on the installment plan" and from the experience thus gained it should be possible to work out something that would be a help to the white collar classes. Meanwhile, if one-half as much time, money, and energy were put into research for better methods of obstetrics, as are given to tuberculosis or cancer, there would be a great eugenic gain.

A vigorous campaign against abortion would be eugenic because abortions are probably more frequent in the upper than in the lower levels of society, due to prohibitive cost if for no other reason. The large amount of permanent injury, difficulty or danger in subsequent childbearing, and actual sterility that follows on abortion should be more widely known.

## CHAPTER XVI

### EUGENIC ASPECTS OF RACE AND NATION

The human species, like other wide-ranging species, is split up into races, which overlap in range of characteristics but which nevertheless can be identified and described for practical purposes. These races have in many instances been subjected for immensely long periods of time to widely different environments,<sup>7</sup> both physical and social in nature, as for instance:

1. In climate, from the Arctic ice to the Amazonian jungle.
2. In exposure to disease, from very few zymotic diseases on the Pacific Isles (until recently), to a long list of such at Singapore
3. In danger from predacious animals, from the absence of any predatory foe to man in parts of Polynesia to the Mid-African combination of crocodiles, lions, rhinoceri, and venomous snakes.
4. In war status, from a state of perpetual peace on some Polynesian islands to perennial wars in parts of Borneo.
5. In means of subsistence, from the gathering of food in lavish abundance to periodic famines.
6. From polygamous mating with captured slaves to romantic wooing.

Along with such differences there are others producing marked results in selection, growing out of family customs, private property, occupational stratification, and the like. Developing with these wide diversifications, the various races have come to differ in physical characteristics, many of them obvious and denied by no one.<sup>123</sup> Mental characteristics are not so easily seen, but it is incredible that they have not also become specialized similarly. Wide differences in culture are also observable



between the different races of mankind at any one time, and the members of the superior races are naturally inclined to assume that those inferior to them in culture are germinally inferior as well. A historical perspective gives warning against hasty generalizations of this sort. It has often been remarked that the contemporaries of Julius Caesar regarded the ancestors of the present-day British and German peoples as mere savages, and would have derided the suggestion that these savages would in only a few centuries equal or surpass the Romans in every aspect of culture. From this some writers have leaped to the conclusion that all differences in achievement of races are merely differences in acquired culture and that there are no demonstrable differences between them in actual capacity.

Such a conclusion is so contrary to observation and to all that is known of evolution that it probably could not have been accepted, except for a strong emotional bias in its favor, usually on the part of persons belonging to groups that are, at the time, in an inferior status. Their position is untenable because of such lines of evidence as the following:

1. The higher cultures have not been attained sporadically or merely in response to a specially favoring environment. As one calls the roll of the Indus, Sumeria, Egypt, Crete, Mycenaean, the Hittite, Persia, Greece, Rome, Arabia, northern and middle Europe, China, the Aztecs, the Incas and the Maya, Phoenicia, Scythia, all are caucasoid or mongoloid. There is a notable lack of negroids, Australoids, and Indo-Australoids.

The lack of the Australoids may be accounted for by the isolation of Australia, but not that of the negroids. The Sahara is less a barrier than is sometimes believed, for the valley of the Nile carried the Egyptian culture up past several cataracts to the Nilotic Negro. The Negro extended east over Africa to the Red Sea and it is known there was an effective cultural interchange between Sumeria (in the present Iraq) and very early Egypt. Furthermore, the negroids extended across south Arabia to the East Indies, Melanesia, and the Philippines. There are two sites in Africa where the Negro, perhaps alone,

made some outstanding cultural achievements, but one notes not only his failure to hold the cultural advance, but also the rarity of such achievement.

2. In mixed communities, the negroids hold an inferior class position. It is certain that a too recent slavery and a color line are responsible for this situation in some communities, but these handicaps are not universal and yet the relative status remains. Slavery in itself has not proved an insuperable bar to an able people. The Mamelukes of Egypt were slaves, but they quickly became the real rulers of the country.

3. The contribution of outstanding negroid figures in science, art, and literature (as measured in Nobel Prizes and as listed in international collective biographies) is relatively slight. That the higher percentages that do occur are mainly in athletics, music, and poetry, make it all the more probable that a race difference does exist.

4. A race may lag because it fails to produce inventors or because it is unwilling to appropriate new and useful inventions that arise within its boundaries or is inhospitable to those from an outside culture. For this last feature, the receptivity of cultural novelties, Pitt-Rivers has proposed the apt phrase "culture potential." Of course, each of these deficiencies may be in part culturally determined, but there is nevertheless an innate element, for races have shown a great variation in culture potential, even though in similar environments and with similar surrounding cultures. Some negroids had contact with valuable new cultural ideas from a very early period. The Nilotic Negro, for instance, was in direct contact with the Egyptian culture near the Island of Meroe in the Nile.

As the negroid crossed India to the Philippine Islands and Malanesia, there were many cultural contacts, but where has there been an instance of Negro culture picking up these outside cultural innovations to achieve a lasting higher culture? Which of the West Indies has the lowest culture?

Where the theoretical argument against the mental equality of the races of mankind is so strong, the burden of proof is cer-

tainly on those who dispute it, to produce definite evidence, as for instance from mental tests. But the evidence of these tests is overwhelmingly against the disputants, for it supports the view that there are marked differences between various races. As Thomas R. Garth summarizes <sup>41</sup> a large number of studies: "The intelligence quotients of the southern (U.S.) Negro as obtained cluster around a point of 75, on the intelligence scale, that of whites around 100, that of full blood Indians around 70, that of the Mexicans in the Southwest around 70, that of Japanese and Chinese,<sup>74</sup> like that of whites, around 100. It may be added that in the measurement of groups of Negroes, the average I.Q. varies with the apparent amount of white blood."

Thus confuted by the results of the tests made on many thousands of individuals, the race equalitarians have contented themselves with attacking the tests, instead of offering any affirmative proof of their contentions. It is easy, of course, to see many sources of error in mental testing of this kind. It is easy to recognize that the Negro children in a rural county of Mississippi have not the same educational opportunities, home backgrounds, or language facilities as those in a northern city.<sup>151</sup> On the other hand, the fact that some Negroes were enterprising, prosperous, and industrious enough to leave the cotton fields and move to a northern city might also indicate that they were of superior stock. Their children in this case would make a good showing not merely because of better environment, but because of better heredity. Such analyses of the results can be extended indefinitely. For a full survey of the literature, students must refer to the originals or to convenient summaries. Several points are worth mention here, however:

1. Negroes, both children and adults, have been found markedly inferior to whites in vital capacity.<sup>157</sup> The children grow more slowly <sup>28</sup> and the sex differences indicate a racial differentiation not identical with that of the whites.<sup>43, 144</sup>

2. White children mature more rapidly, in the development of the nervous system,<sup>81</sup> than do Negro children in the same

locality. "It is significant that even with very young subjects when environmental factors are minimized, the same type and approximately the same degree of superiority is evidenced on the part of the white subjects as that found among older groups." <sup>90</sup>

3 Differences in temperament and emotional reaction also exist, and may be more important than the purely intellectual differences. <sup>173</sup>

4. There is a large overlapping between the test scores of members of the two races <sup>155</sup>

5. Mulattoes generally stand between full-blood Negroes and whites, and the more white blood a colored person has, the better is likely to be his rating on an intelligence test. <sup>155</sup>

In the light of such facts as the foregoing, it seems premature, to put it mildly, to argue that there are no fundamental differences of mentality between different races. The burden of proof is on those who would deny the existence of differences. They have offered no evidence of equality. Until they do so, it is incumbent on all who are charged with framing national policies, to proceed on the assumption that there are marked differences between the various races of mankind and that, in some cases at least, these differences are so wide that one race may properly be spoken of as inferior to another in average endowment with a given characteristic.

The biological aspect of interracial marriages is twofold. If one race is inferior to another, and if the partners in question are representative of their respective races, then the mating is between two persons, one of whom is inferior to the other germinally, and the offspring will usually be inferior to those resulting from a better-assorted mating. This result introduces no new idea. It is obvious and, in principle, not subject to dispute.

If, however, the two races in question are of such a level that neither on the whole can be called inferior to the other, but they are markedly *different*, as a result of the long process of evolution which has made them distinct races, the results of a cross can not be predicted confidently in advance. They

must be studied for each cross. Two or three theoretical considerations have been raised by various writers.

1. Where races differ markedly in size or relative proportions, it is argued that the offspring may inherit separate and unconformable elements from the respective parents. Thus a child with the short legs of a Japanese terminated by the large feet of a Nordic might find himself conspicuous. If he inherited a small body from one parent and large vital organs from another, the latter might find themselves inconveniently crowded in the thorax and abdomen. If he inherited large teeth from one parent and a small jaw from the other, the result might be crowded teeth, mal-occlusion, and a generally inferior dental equipment.

A small amount of evidence has been brought forward to support such claims but the weight of the immense body of evidence from experimental breeding is against them. Bodily proportions are nearly all due to multiple genes and the processes of development seem to accommodate themselves well to wide differences of parental inheritance. Extreme crosses as between large and small dogs or large and small rabbits have been studied minutely, and so far as general vigor and coordination are concerned, there is little or no evidence of any real difficulty. Gross morphological disharmonies such as those suggested in the preceding paragraph are improbable.

If disharmonies do result, they should be expected not in gross morphological features such as body proportions, but in the most highly organized and complicated structures, such as the eye and the central nervous system. Such structures depend for accurate functioning on extremely precise adjustments, and theoretically it might be expected that the results produced by a well-balanced gene-complex in any race might be seriously disturbed if this were combined with an entirely different gene-complex from some other race. Here again theory is not enough, and a great deal more research should be done along these lines. There are suggestions that the results just mentioned are actually found. In parts of Germany where

a long-skulled race has mixed most freely with a broad-skulled one, it is claimed that there is a striking excess of eye defects, as compared with regions in which the population is more predominantly either long-skulled or broad-skulled.<sup>120</sup> This might be accounted for if the proportions of the eyeball are in general conformable with those of the skull. A cross would produce errors of refraction in many instances. As to the central nervous system, the study of mulattoes in Jamaica, where the environmental handicaps of half-breeds are relatively slight, seemed to show an excess of mental defects over the expected proportions.<sup>21</sup>

This is the line along which further investigation of racial crosses should proceed most energetically. With the scanty evidence now extant, it can only be said that the possibility of disharmony in highly organized traits, which is theoretically established, has by no means been ruled out in actual observation, and that the possibility is serious enough to create a distrust of wide racial crosses, even where the two races are, each in its own way, of good ability. It is obviously not enough to cite general principles of genetics. Each possible cross must be studied carefully, under favorable conditions, through several generations. Fortunately for this purpose, enough racial matings of every possible sort have taken place to furnish material for study, if more attention were paid to it.

2. If two races are crossed, which differ widely in their characteristics, the expectation would be that, after the first generation, their descendants would show a greater range of variability. This has been urged, both as an advantage of race-crosses, because giving natural selection more material on which to work, and as a disadvantage, because some of the variations will be unfavorable. But this variability, which originates in genetic segregation, is most marked in the case of simple Mendelian traits, and there are few such among the normal traits of mankind. Such studies as have been made on mixed populations of divergent make-up have tended to show that the variability is rather less than was expected.<sup>126</sup> To the student it

is an interesting aspect of the genetics of race-crosses, but its practical eugenic importance does not appear to be great.

3. Hybrid vigor has also been widely discussed. On the one hand, there is a wide range of opinions that race hybrids, particularly those between the white and Negro races, are an inferior group. On the other hand, it is contended that the results of experimental breeding commonly show appearance of unusual vigor among hybrids, due presumably to the bringing together from the two parents of complementary genes producing vigor. It is therefore argued that hybridization is desirable to produce vigor. One of the examples cited, the mule, is an unfortunate one, in view of his well-known lack of any "pride of ancestry or hope of posterity." The whole argument seems to have very little substance. The inferiority of hybrids can in many cases be explained plausibly by the poor quality of their parents and the environmental and other handicaps in which they grow up. If any hybrid vigor actually appears it would, by theory, appear mainly in the first generation of hybrids and would thereafter be unimportant. No evidence of hybrid vigor could be detected among the browns of Jamaica.<sup>21</sup>

On the whole, the literature on the biology of race crossing is remarkable for abundance of preconceived ideas and scarcity of any real evidence. Half a dozen studies have been published of small populations descended from wide original crosses.<sup>22</sup> These populations seem at least to be healthy animals, with nothing particularly distinctive about them. Hybrid offspring are generally more or less intermediate between their parents. It is probably safe to say that the physical disasters foreseen by alarmists, as the result of racial crossing, are as imaginary as the beautiful results pictured by some of the American abolitionists of a century ago, who described the superman that would be produced when the fine qualities of the liberated slaves should be united with the fine qualities of their former owners. Experience shows that the evil qualities of both parents are just as likely to make themselves conspicuous as are the good qualities.

Intermarriage in general, between a superior and an inferior race, is objectionable just as is intermarriage in particular, between a superior individual and an inferior individual, and for similar reasons. If the two races are of equal general value, but both highly specialized by centuries of separation, there is good reason to fear that the most highly specialized and most valuable qualities of each will be the ones most likely to be impaired by crossing. Unless and until this possibility can be ruled out by satisfactory evidence, race crossing between widely divergent races should be reprobated by public opinion and, where possible, prevented.

So far as the problems of a nation like the United States are concerned, however, the genetic aspects of race crossing are only a part, and often the least important part, of the eugenic aspects. The influence of an alien group on reproductive selection is frequently far greater and more rapid than any possible influence that the same group could have in changing the hereditary make-up of the population. This is the result of social and economic factors, not of biological factors.

Alien arrivals in the United States during the last century have, in the majority of cases, been obliged to begin at the bottom with relatively unskilled labor. This was an outgrowth of their ignorance of American language and customs, if not of their inferior ability as was often the case in later years. They therefore displaced native labor. It has often been pointed out that this was advantageous to the native, because he was pushed up into a better job. But if this displacement, involving a higher standard of living, also tended to decrease fecundity, the immediate advantage was outweighed by the racial loss. The effect is so great that it has been seriously questioned whether immigration ever really increases the population of a country that already has a substantial body of settlers.<sup>94</sup> Any influx of immigrants, it is argued, merely replaces children or grandchildren of the original settlers, who would otherwise have been born but whose birth is prevented by the complex processes that result in the lowering of a birth-rate under the





EXAMINING IMMIGRANTS AT ELLIS ISLAND

FIG. 37.—Surgeons of the United States Public Health Service test every immigrant, physically and mentally, in order to send back any who give promise of being undesirable additions to the population. Valuable as such regulation is, it could be done abroad much better, and supplemented by a study of the intending emigrant's ancestry, thus giving a better chance to eliminate those who are likely to be liabilities to the United States from a eugenic point of view Photograph from U. S. Public Health Service

impact of immigrant competition and pressure. From this point of view, the 30 million immigrants admitted to the United States since the Civil War have merely taken the places of 30 million unborn children of the older stock; and if immigration had been entirely prohibited since the time of the Civil War, the census of 1930 would have shown a population of 122,000,000, none the less. Obviously it is impossible either to prove or disprove such a thesis, but the tendency, which has sometimes been dignified by the name of Walker's Law, is real <sup>131</sup>

Immigrants have tended to marry, first in their own group, second into other immigrant groups most like their own, third with the stock that arrived in earlier generations. The amount of racial intermarriage has increased with each succeeding generation <sup>132</sup> The fecundity of immigrant women has nearly always been higher than that of the native stock, <sup>141</sup> but the fecundity of immigrant groups as a whole has been lowered by the fact that men often outnumbered women in them. The various stocks have differed greatly in this regard. Jews have usually brought their families, while in some groups such as Spaniards, Bulgarians, and Greeks, men have outnumbered women five or ten to one. The second generation, among the immigrant peoples, has tended to approximate more nearly the fecundity of the native stock. Differences in infant mortality have also lowered the net contribution of some immigrant stocks

There has always been a movement of population both ways, to and from the United States. Immigrants returning to foreign countries have often amounted to one-fourth or one-third of the number arriving, and for some years after 1929 the number leaving the United States was much greater than the small number admitted. All these various factors have to be taken into account in determining the general effects of immigration into the United States.

Without going into a tedious discussion, the following principles may be laid down as those which should govern the admission of immigrants to the United States henceforth:

1. No immigrant should be admitted who is not of good biological quality, sound in mind and body, and of good family stock. This requires some investigation of his family, as well as physical and mental examination of the individual, and should be done, as is now the case, at the point of departure, not at the point of entry to the United States. Thus the unpleasant situation that has too often existed in the past would be prevented, of an immigrant rejected at New York or San Francisco and obliged to make a long trip back home after he has broken his ties with his homeland. In a general way, the rule should be enforced that no one will be admitted to the United States as a permanent resident, who is not superior to the average of the population already here. This would make of every new arrival a probable asset, eugenically, while many of those who arrived in the last half century were obviously liabilities.

2. In addition to evidence as to soundness of mind and body, evidence should be required of good character. Apart from euthenic advantages, this would probably promote better mate selection and parenthood.

3. Large numbers of persons should not be admitted, who are radically dissimilar to the present population. The reasons for this are partly genetic, as outlined a few pages earlier, partly social but with strong eugenic implications. The entry of large groups who differ widely from the prevalent population in respect to culture, language, color, religion, family organization, and the like tends to establish segregated areas in American cities, where cultural assimilation of the new arrivals is slow. Apart from the social and economic maladjustments which are likely to result from the existence of such foreign blocks, and the disturbance to American political and educational institutions, such racial isolation promotes intermarriage on the basis of traits that are not eugenic in significance.

The National Origins provision for restriction of immigration, that was adopted in 1924, attempted to insure that dissimilar groups would not arrive too rapidly, by limiting the

total immigration to about 150,000 in any one year, and dividing this up between foreign countries in proportion to the number of their representatives in the existing population. This discriminated in favor of Northern and Western Europe, as against Eastern and Southern Europe. President Hoover's Committee on Social Trends, reporting in 1933, declared that "this policy selects a physical type which closely resembles the prevailing stock in our country, for about 85% of the whites in the United States in 1920 were from strains originating in Northwestern Europe where Nordics predominate."

The preference thus assigned to Nordic or partly Nordic peoples has given rise to a highly emotional and sometimes bitter controversy, particularly from some non-Nordic persons who fancied that the preference given to Nordics was invidious. There is no reason to consider it such. It is an attempt, and a reasonably successful one, to prevent too rapid change in the make-up of the American population, to avoid too great and sudden impairments of national unity.<sup>49</sup> As such, it has real though largely indirect eugenic value. But the National Origins provision is, in itself, far from adequate to establish selective immigration along eugenic lines. It should at least be supplemented by providing that, under the various national quotas, only individuals will be admitted who are above the present average of the American population, in respect of health and intelligence.

Asiatics are at present excluded from permanent immigration to the United States, by virtue of an act of Congress dating back to 1790, with various subsequent acts and a decision of the United States Supreme Court.

This absolute exclusion has given offense to many Asiatics, and might well be replaced by some other and less invidious regulation. Application of the National Origins quota to Asiatics would result in the possible immigration of only a few hundreds each year, and if the basis of individual selection were made high enough, the resultant eugenic damage, if any, would probably be negligible. The greatest defect of the Na-

tional Origins quota was the failure to apply it to the Western Hemisphere.

4. A sound policy of immigration should not only admit persons who are superior and not too dissimilar to those already here, but it should admit them only in such numbers as will allow them to be incorporated in the population without too much effort, friction, or delay. Otherwise there is an impairment of the opportunities for the recognition of ability and for its free promotion, and good reproductive selection is placed under a handicap.

5. There is probably justification for additional regulation of the economic classes to be admitted, according to the prevalent needs of American agriculture, business, and industry. Otherwise an unfavorable economic balance is produced, which reacts adversely upon national eugenics,—always particularly sensitive to economic influences.

6 Finally, the numbers of immigrants should be regulated, with relation to their probable future fecundity as well as to the annual immigration statistics, so as not to disturb too seriously the attempts to keep the population at an optimum figure. In this connection it must be remembered that each new arrival may merely replace a native who will not be born because of this new immigrant arrival.

Apart from the general regulation of immigration, the United States has a number of special problems that offer difficulty. Of these, that of the American Indian is one of the least serious. According to the census of 1930, there were only 332,397 Indians in the United States. Of these a large proportion, often estimated as high as one-half or even three-fourths, already has white blood. (In a few localities there has also been extensive Negro intermarriage.) While a few tribes in the Southwest may retain substantial purity and perpetuate themselves indefinitely, it seems certain that the rest of the Indians will either die out or be absorbed in the white population within a few generations.

As a result of the war with Mexico, the United States ac-

quired in 1847 the territory that now comprises the states of New Mexico, Arizona, and California. Many Congressmen wanted to take a good deal more, including Lower California and a large part of what is now Northern Mexico, but fortunately were overruled. The area acquired by treaty and by the Gadsden Purchase had a population of probably not more than 85,000 excluding Indians. Indeed, it was largely the scantiness of the population of this area, like that of Texas a few years before, that led to its loss to Mexico. New Mexico and Arizona were slowly, Texas and California rapidly, filled with Americans. About the beginning of the present century, and more conspicuously after the World War, began an immigration of Mexicans which in time amounted to at least a million, probably more, and was often described as the virtual reconquest of this lost territory by Mexico. The migrants were mainly of Mexican-Indian stock, nearly all unskilled laborers, and by all tests, even when full allowance was made for language difficulties,<sup>61</sup> they showed an average of intelligence lower than that of the American Negro. At the same time they were much more fecund than the whites. Few of them became naturalized, and they tended to form segregated groups, retaining their own language; they also placed a heavy burden on the charitable agencies of the communities in which they lived.

The economic depression which began in 1929 placed them under such a handicap that several hundreds of thousands of them returned to Mexico and the immigration of others was almost stopped, partly by more stringent regulations at the border, and partly by lack of demand for their labor. This gave a breathing space for reconsideration of the whole question of their free immigration.

With 15,000,000 Mexicans separated from the United States only by an imaginary line, or by a river which in many places can be forded even by small children, it is evident that only the adoption of a well-considered policy, and adequate means to enforce it, will serve to protect the United States from the

entry of large numbers of unskilled laborers at any time that economic conditions are favorable. Fortunately, the Mexican government has been disposed to coöperate with that of the United States to control immigration, as it does not want to lose too many of its citizens. It should not be impossible, therefore, to work out a plan that will be mutually acceptable, maintaining friendly relations with an important neighbor and at the same time protecting the southwestern United States from being overwhelmed by immigrants with a low standard of living and without any apparent large contribution of a eugenic nature to make to the future population of the United States.

The first and most obvious proposal for restriction was to extend the quota system to the Western Hemisphere. The obstacle to this extension was the unique position of Canada, lying alongside of the United States for its whole length, and settled by 10,000,000 people with the same racial make-up, the same language (with the partial exception of the French-Canadian block in Quebec), and the same traditions. There has been throughout the history of the two countries a free interchange of population that has been of value to both, and *the idea of stopping this has had few advocates.*

Apart from the special case of Canada, it has long been felt that application of the quota, or other restriction, to immigration from the Western Hemisphere would cut off many immigrants of little value and few who would make any real contribution. Apart from Canadians and Mexicans, most of the immigrants of the last few decades have been Negroes from the West Indies, who have congregated on the eastern seaboard, particularly in New York, to intensify an already serious racial problem.

Immigration from Puerto Rico is a still more serious problem, but an insoluble one at present, since the island was given territorial status and therefore its one and one-half million inhabitants, a large part of whom have at least some Negro blood, have as much right to come to the mainland as a citizen of

North Dakota has to move into South Dakota. They have created a serious problem in New York City, but on the whole the Puerto Rican so far has shown a distaste for emigration, and a desire to repatriate himself when he has left his island. It is questionable whether there is any constitutional way in which the United States could let go of this territory if it desired to do so. Meanwhile the Puerto Ricans are citizens of the United States and will be accepted as such. As the island is greatly overpopulated in proportion to its resources, the extension to it of adequate facilities for the spread of contraceptive information and for sterilization of some of the defectives, is of the highest importance.

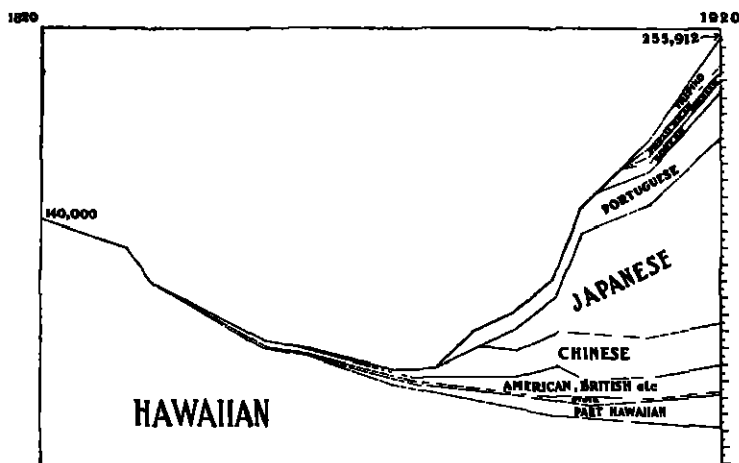
Fortunately the imperialistic wave which, a generation ago, took over Puerto Rico and the Philippines, has spent its force and there is no prospect of any new annexation of territory with unassimilable inhabitants. One can only be glad that earlier efforts did not succeed, such as the attempt in the time of Henry Clay to annex Cuba, and that which President Grant sponsored, to annex Santo Domingo.

Hawaii has attracted much attention because of the predominantly Oriental character of its population, and because of the great diversity of races, who live together there in a relationship that seems on the whole to be very friendly. Pure-blood Kanakas have become rare. The Chinese population has tended, until recently, to intermarry freely with other groups; the larger Japanese population has tended to maintain its racial integrity and within a few years will dominate the island. Since all who are born in the territory are citizens of the United States, there can be no question of excluding them from the mainland, if they want to enter. The population of the islands, about 370,000, is not large enough to present a formidable problem in bulk, and the territory may well serve as an experiment station for the study of interracial relationships and the results of race mixture.

The 13,000,000 inhabitants of the Philippine Islands are on a different basis, not having American citizenship. Even if



the islands should not be granted independence, therefore, there is no legal obstacle to preventing the immigration of Filipinos to the United States, and experience on the Pacific Coast has furnished ample evidence that restriction is desirable. The thousands of Filipinos who came to California were nearly all unmarried young men. If they marry, they must compete



TRANSFORMATION OF HAWAII'S POPULATION

FIG 38.—This chart shows graphically how the racial make-up of the Hawaiian Islands changed in a century. Beginning with a population of 140,000 in 1820, the natives gradually decreased, while after a few decades the numbers of aliens began to increase. By 1920 the pure Hawaiians constituted only 11% of the population, and were equalled by several other groups, all of which were equally outnumbered by Japanese. In principle, the same sorts of changes have taken place in the racial make-up of many other areas including (though to a less marked degree) the continental United States. After Louis R. Sullivan.

with residents for wives, and their attentions to white girls were often the cause of or occasion for racial conflict. If they do not marry, they tend to form segregated communities of unmarried men in the large cities, and again to become a social as well as an economic problem. It would seem highly desirable to limit the arrival of Filipinos largely to those who come as students and who expect to return to the islands.

There remains for consideration the greatest problem,—that of the Negro. Of 122,775,046 inhabitants found by the census of 1930, 11,891,143, or 13.6% of the total, are classed as Negroes. This is a substantial decrease in percentage from the figures in the first census, when Negroes formed nearly 20% of the whole; but the gain of the whites in the intervening 140 years has been largely due to immigration.

So long as the Negroes remained in the rural South, they had in general a high fecundity and also a high mortality. During the last two decades, however, there has been a widespread movement of Negroes from the South to the North and West, under the impulse given by economic conditions. Most of the northern migrants went into cities, where their vital statistics improved. Prior to 1920, deaths usually exceeded births, among the Negroes of northern cities. Since 1920, there has been a betterment in sanitation and hygiene, with a reduction of the infant mortality rate by nearly one-half, in the Negro populations of some northern states. This has brought about a situation in which the northern Negroes are probably at least holding their own.

How far this is due to a favorable age-composition of the Negro groups in the North, remains to be seen. The Negro is not so well adapted to cold climates as is the white, and suffers from an excess of respiratory diseases. Moreover, under urban conditions the practice of contraception is spreading rapidly. It is possible that the Negro can not maintain himself in the northern states, but it is too soon to say that this has been proved.

On the whole, Negroes in the United States marry younger than the whites, and have larger families than the native whites but not so large as the foreign-born whites. While their infant mortality tends to decrease, the maternal mortality has tended to increase. The race has been particularly ravaged by venereal diseases.

The Negroes brought directly to the United States, from 1620 on, represented a large variety of stocks, though mostly

from West Africa. From the beginning, they have mixed to some extent with the whites, mainly through irregular matings of white males with black females. The result is that probably a minority <sup>64</sup> (the figure has been put as low as 20%) of the present Negroes of the United States are of unmixed black blood. The quality of the white stock that has thus mixed with the black has been much discussed, with little real evidence. There is abundant testimony from the early historians of the difficulties caused by the lowest class of white settler in this respect. In later generations doubtless some better germ-plasm was added to the Negro race through the black concubines taken by white men. At present it is generally thought that miscegenation is decreasing, and that the whites involved are mostly of the lower social and economic strata, and particularly members of some South European stocks recently arrived in the United States.

Probably the amount of white blood among American Negroes has been exaggerated because the subject has too often been studied in northern cities, where mulattoes predominate. A study of the "Black Belt" in the South would yield different impressions. Sentiment against miscegenation seems at the present time to be growing, not merely among whites but among blacks as well, and some states have made fresh efforts to prevent this, Virginia being a conspicuous example with its Racial Integrity Law (1924), forbidding intermarriage of whites and Negroes and defining a white person as one with *no* Negro heritage, a Negro as one with *any* ascertainable degree of Negro heritage. The "Pocahontas tradition" was apparently potent enough to make a slight exception for the American Indian, a man being classed as white if he has not more than one-sixteenth of Indian blood, provided there is no Negro intermixture. In the administration of this law, the state's Bureau of Vital Statistics has been accumulating a great deal of information about the racial make-up and ancestry of the present population.

The assertion has often been made that, with the proportion

of Negroes present in America and the amount of race crossing that has actually taken place, the future population of the continent will inevitably be of a light coffee color. Such a result is not necessarily to be expected in any future that can now be foreseen. The amount of race crossing at present is probably less than at any previous time in a century, and it seems quite likely that it will continue to diminish as effective barriers in sentiment if not in law are set up. While laws preventing racial intermarriage are desirable, public opinion will probably be the most effective restraint.

It has also been assumed that all Negroes will eventually be mulattoes, because the amount of white blood already carried by them will continue to spread. This again is an assumption to be tested by the facts. Its realization depends on relative death- and birth-rates. The blacks of the rural South are the most fecund, while the mulattoes in the North tend to keep down the size of their families, and this tendency is increasing as knowledge of contraception becomes more widely available. It is not at all impossible, therefore, that a century from now the two races will be farther apart in the United States than they are today, due to the disappearance of a large part of the mulattoes. One factor operating in the contrary direction is the high value placed on light skin, as an evidence of white blood, by Negroes themselves. The successful Negro wants to marry a wife with a skin lighter than his own, and often does so. But since the others must marry some one, the effect of this preferential mating is not so great as has been supposed. The degree of assortative mating (.34) for skin color among mixed Negroes is comparable with that for most other physical characters among other peoples.

A century ago, some philanthropists looked to repatriation of the Negro in Africa as a solution of the race problem in America. The fate of the little republic of Liberia, started at that time, is not reassuring, though the idea persisted for a generation longer, and was held by Abraham Lincoln. At present it is almost universally believed that the Negro is in America

to stay, and that the race problem must be solved on this basis, though there are *not* lacking, from time to time, "Back to Africa" movements among the Negroes themselves, which indicate that many would be willing to return if economic and social conditions were favorable; that they have no sentimental attachment to the United States. As a fact, studies of "social distance" show that American Negroes feel themselves farther removed from American whites than from the whites of any other civilized country.<sup>8</sup>

Assuming that the problem must be dealt with on the basis of existing conditions, there are several possible, even if incomplete, solutions:

1. Racial fusion is well advanced in Brazil, Cuba, and some other parts of the Western Hemisphere. For reasons given above, it may be excluded on eugenic grounds. Moreover, the tendency in the United States now seems to be in the opposite direction.

- 2 Racial segregation is seen on a large scale in Liberia and Haiti, where the results have not been satisfactory to anyone. It is seen in a modified form in parts of the South where Negroes are so much in the majority that virtually all whites have moved out of given areas and have abandoned whole counties to the blacks. It is possible that this tendency may continue.

3. Racial parallelism is the condition existing in the southern United States, where the two races live side by side, but with a "color line" between them. Each pursues its own way to a large extent, and there are separate educational facilities (often greatly to the disadvantage of the Negro).

4. Racial cooperation on the basis of equality has not been tried on any large scale in the United States. It is perhaps most nearly approached in Jamaica. Here, however, it has shown a tendency to approach racial fusion. While a small race-conscious group of whites maintains racial integrity, a large part of the population is made up of mulattoes (who call themselves "colonials") and who are definitely the dominant element on the island. This example, and less conspicuous or smaller

ones elsewhere, indicate that racial cooperation on a basis of equality is not a feasible policy unless preceded by thorough education of both groups to a degree which has not been reached as yet.

The United States has been trying all of these policies at once, in different places at different times, and to different extents. It is perhaps too soon to adopt any one policy as universal, given the particular difficulties in the way. If eugenic values are to be safeguarded, it is essential to prevent miscegenation between whites and blacks in the United States, so far as that is possible. Laws are of little avail unless backed by public opinion. It is therefore essential that the color line be maintained for the present, though it may be relaxed in details from time to time as both races are educated as to the scientific basis of interracial relationships. There is already a tendency toward modification in such respects as equality of educational opportunities, forms of salutation, privileges in traveling, in hotels and restaurants, and in places of amusement. Further progress in these directions will depend on an understanding of the meaning of the color line. During the past decade there has been an agitation in certain religious circles in the North, in favor of a complete removal of any discrimination or distinction between black and white. This represents an attempt to remove certain undeniable social evils, without due regard to biological and psychological facts. Any such movement that gets out of touch with reality will do much more harm than good, and will probably lead to reactions which it would greatly regret to see.

Political discrimination against the Negro has been motivated in many cases by an unwillingness to see whites subjected to Negro political domination. This unwillingness may lead, as indicated earlier, to an extension of racial segregation in the South, thereby allowing Negroes a greater degree of local self-government. It may lead also to a radical change in some of the forms of representation in legislative bodies. In such event, a Negro member of a state legislature, for instance,

would sit merely as a representative of his own people, and not as a representative of a white minority as well as a black majority in his district.

Meanwhile, the Negro should be helped by the dominant group in the United States to develop along his own lines. It is desirable not to subject him to too severe competition with the whites; yet such competition, acting as a stimulus, is responsible for much of the progress he has made in the United States in the last century, as compared with the slow progress he has made when left to himself, as in Liberia and Haiti. The best way to temper competition is by differentiation of function, but this should not be carried to the extent of reserving only blind-alley occupation for Negroes. Education of the race should be guided by the results of psychological tests showing the nature of Negro mentality and emotional make-up.

Eugenic measures should be applied within the black race as within the white race. Birth control is now operating dysfunctionally in both groups. More vigorous effort should be made to put the necessary information and material in the hands of Negroes at the lower levels of intelligence, education, and economic capacity, just as among whites at similar levels, and facilities for sterilization of defectives should be provided in each group. Appropriate measures for the encouragement of superior families should be applied in black as well as in white society.

Finally, research on race problems should be pushed much more vigorously in all lines, and as fast as unimpeachable findings are brought to light, they should be embodied in current education. In proportion as both races are well grounded in an objective sociology, psychology, and biology, will the friction be eliminated from race relationships without irreparable eugenic losses.

## CHAPTER XVII

### THE EUGENIC ASPECT OF SOME EUTHENIC MEASURES

#### 1. SOCIAL

Nearly every law, custom, or institution of a country has an influence direct or remote on eugenics. The eugenic progress to be expected if laws and customs are gradually but steadily modified in appropriate ways compares in importance with definite eugenic efforts. In the present chapter and the one following we discuss a number of miscellaneous measures that are actuated primarily by euthenic purposes but that also have a eugenic importance which is sometimes overlooked

#### DEMOCRACY

By democracy we understand a government which is responsive to the will of a majority of the entire population, as opposed to an oligarchy where the sole power is in the hands of a small minority of the population, who succeed in imposing their will on the rest of the nation. We have pointed out elsewhere that it is of great importance that the road for promotion of merit should always be open, and that the road for demotion of incompetence should likewise be open. These conditions are probably favored more by a democracy than by any other form of government, and to that extent democracy is distinctly advantageous to eugenics.

Yet this eugenic effect is not without a dysgenic after-effect. The very fact that recognition is attainable by all, means that democracy leads to social ambition, and social ambition is one of the factors in the production of smaller families. This influence is manifested mainly in the women, whose desire to



ascend the social ladder is increased by the ease of ascent where there are no rigid social barriers. But while ascent is possible for almost anyone, it is naturally favored by freedom from handicaps, such as a large family of children. In the "successful" business and professional classes, therefore, there is an inducement to the wife to limit the number of her offspring, in order that she may have more time to devote to social "duties." In a country like pre-war Germany, with stratified social classes, these classes had larger families. The solution in America is not to create an impermeable social stratification, but to create a public sentiment which will honor superior women more for motherhood than for eminence in the largely futile activities of polite society.

In quite another way, too great democratization of a country is dangerous. The tendency is to ask, in regard to any measure, "What do the people want?" while the question should be "What ought the people to want?" The vox populi may and often does want something that is in the long run quite detrimental to the welfare of the state. The ultimate test of a society is whether it is strong enough to survive, and a measure that all the people, or a voting majority of them (which is the significant thing in a democracy), want, may be such as to handicap the state severely.

In general, experts are better able to decide what measures will be desirable in the long run, than are voters of the general population, most of whom know little about the real merits of most of the many important projects. Yet democracies have a tendency to scorn the advice of experts, most of the voters feeling that they are as good as anyone else, and that their opinion is entitled to as much weight as that of the expert. This attitude naturally makes it difficult to secure the passage of measures which are eugenic or otherwise beneficial in character, since they often run counter to popular prejudices.

It follows that the initiative by small petitions, and the referendum as a frequent resort, are dangerous. They are of great value if so qualified as to be used only in real emergencies, as

where a clique has got control of the government and is running it for its self-interest, but as a regularly and frequently functioning institution they are unlikely to result in wise statesmanship.

The wise democracy is that which recognizes that officials may be effectively chosen by vote, only for legislative offices; and which recognizes that for executive offices the choice must be definitely selective, that is, a choice of those who by merit are best fitted to fill the positions. All methods of choice by properly judged competition or examination with a free chance to all, are, in principle, selective yet democratic in the best sense, that of "equality of opportunity." When the governing few are not the best fitted for the work, a so-called aristocracy is of course not an aristocracy (government by the best) at all, but merely an oligarchy. When officers chosen by vote are not well fitted then such a government is not "for the people."

Good government is then an aristo-democracy. In it the final control rests in a democratically chosen legislature, to which only the qualified may be candidates, working with a legislative commission of experts, but all executive and judicial functions are performed by those best qualified on the basis of executive or judicial ability, not vote-getting or speech-making ability. Universal education and an educational qualification are needed for the electorate.

### SOCIALISM

It is difficult to define socialism in terms that will make a discussion practicable. The socialist movement is one thing, the socialist political program is another. But though the idea of socialism has as many different forms as an amoeba, there is always a nucleus that remains constant—the desire for what is conceived to be a more equitable distribution of wealth. The laborer should get the value which his labor produces, it is held, subject only to subtraction of such a part as is necessary to meet the costs of maintenance, reserve, and needed expansion; and in order that as little as possible need be subtracted for

that purpose, the socialists agree in demanding a considerable extension of the functions of government: collective ownership of railways, mines, and other instruments of production, or cooperative producing units. The ideal socialistic state would be so organized, along these lines, that the producer would get as much as possible of what he produces, the non-producer nothing, and yet efficiency maintained.

This principle of socialism is almost invariably accompanied by numerous associated principles, and it is on these associated principles, not on the fundamental principle, that eugenics and socialists come into conflict. Equalitarianism, in particular, has so great a part in the history of socialism and in current socialist thought that it is doubtful whether the socialist movement could abandon it. This equalitarianism is usually interpreted not only to demand equality of opportunity, but to assert a substantial equality of native ability to avail itself of these opportunities.

Anyone who has read the preceding chapters will have no doubt that such a belief is incompatible with an understanding of the principles of biology. How, then, has it come to be such a pervasive accompaniment of socialism?

Apparently it is because the socialist movement is, on the whole, made up of those who are economically unsatisfied and discontented and aims its propaganda at these groups. Most of the intellectual leaders of the movement are far from inferior, and are aware of the range of human difference, but they too often find it necessary to comply with the views of their following in order to retain their leadership. A group which finds itself in an inferior status naturally falls into an attitude of equalitarianism, whereas a group which finds itself superior to the rest of society does not normally do so.

Before criticizing the equalitarian attitude in detail, we will consider some of the criticisms which some socialists make of eugenics.

1. It is charged that eugenics infringes on the freedom of the individual. This charge (really that of the individualists

more than of socialists strictly speaking) is based mainly on a misconception of the purpose of eugenics. Coercive measures have little place in modern eugenics, despite the gibes of the comic press. The program calls for little interference with the freedom of the normal individual to follow his own inclinations in regard to marriage or parenthood. Indirect measures and the education of public opinion are the principal methods of procedure which are included. Coercive measures are limited to grossly defective individuals, to whom the doctrine of personal liberty can not be applied without stultifying it.

2. Eugenics has been further charged with ignoring or paying too little attention to the influence of the environment in the improvement of human welfare. This charge is well founded in some instances, but it is not an inherent defect in the eugenics program. Eugenics assumes that both sets of factors will be taken into account, whereas in the past the factor of heredity has been too often ignored.

3. Again, it is alleged that eugenics proposes to substitute an "aristocracy" for a democracy. We do think that those who have superior ability should be given the greatest responsibilities in government. If aristocracy means a government by the people who are best qualified to govern, then eugenics has most to hope from an aristo-democratic system. But admission to office should always be open to anyone who shows the best ability, and the search for such ability must be much more thorough in the future than it has been in the past.

4. Eugenics is charged with hindering social progress by endeavoring to keep woman in the subordinate position of a domestic animal, in opposing the movement for her emancipation, by limiting her activity to childbearing and refusing to recognize that she is in every way fitted to take an equal part with man in the world's work. This objection we have answered elsewhere, particularly in our discussion of feminism. We recognize the complementary and mutually dependent nature of the two sexes, but ask for only such differentiation of function as corresponds to biological sex-specialization. We

can not yield in our belief that one of woman's greatest functions is motherhood, but recognition of this should increase, not diminish, the strength of her position in the state.

5. Eugenics is charged with ignoring the principle of economic determinism, which asserts that a man's acts are governed mainly by economic conditions. It is obvious that there are differences in the achievements of fellow men. Having refused to accept the great weight of germinal differences in accounting for the differences in achievement, and wishing to show that great benefits will result from the economic changes they propose, socialists naturally turn to the theory of economic determination. This furnishes ground for glowing accounts of the Utopia which could be created by economic reform, and therefore fits in well with the needs (whether conscious or unconscious) of the propagandists. When the failure of many nations to make use of their great resources in coal, oil, and water power is remembered, and the ability of others to make great progress in spite of amazing economic limitations, as in Japan, when the fact is recalled <sup>139</sup> that most of the radical leaders of the last hundred years have been the sons of men in business and profession and managerial ranks, and have never themselves been part of the "exploited masses"; it must be believed that the excessive importance of economic determinism in the socialist's mind is caused more by its value for his propaganda purposes than by a weighing of the evidence. The reality of a considerable rôle of economic determinism is of course indisputable.

Such are, we believe, the chief grounds on which socialists criticize the eugenics movement. All of these criticisms should be stimulating, should lead eugenicists to avoid mistakes in program or procedure. But none of them, we believe, is a serious objection to anything which eugenics proposes to do.

What is to be said on the other side? What values and faults does eugenics find in the socialist movement?

For the central principle, the more equitable distribution of wealth, no discussion is necessary. All students of eugenics

would probably assent to its general desirability, although there is much room for discussion as to what constitutes a really equitable division of wealth.

If one man is by nature as capable as another, and equality of opportunity can be secured for all, it must follow that one man will be worth just as much as another, hence the equitable distribution of wealth would be an equal distribution of wealth, a proposal which some socialists, such as G. Bernard Shaw, have made. Most of the living leaders of the socialist movement certainly recognize the fallacy of equalitarianism but it seems so far to have been found necessary to lean very far in this direction for the success of the socialist propaganda to meet the views of those thus brought in to the movement.

Now this idea of the equality of human beings is, in every respect that can be tested, false, and any movement based on it will either be wrecked or will wreck the society which it tries to operate. It will mean the penalization of real worth and the endowment of inferiority and incompetence. Eugenics can feel no sympathy with procedures which are so completely at variance with the facts of human nature.

The practice of the Soviet Union in paying salaries varying from 40 to 600 rubles, a range of 1 to 15, in spite of a strong desire for equality, is significant.

But if it is admitted that men differ widely, and always must differ, in ability and worth, then eugenics can be in accord with the socialistic desire for distribution of wealth according to merit, within limits, for this will make it possible to favor and help perpetuate the valuable strains in the community and to discourage the inferior strains. T. N. Carver sums up the argument concisely:

"Distribution according to worth, usefulness, or service is the system which would most facilitate the progress of human adaptation. It would, in the first place, stimulate each individual by an appeal to his own self-interest, to make himself as useful as possible to the community. In the second place, it would leave him perfectly free to labor in the service of the

community for altruistic reasons, if there was any altruism in his nature. In the third place it would exercise a beneficial selective influence upon the stock or race, because the useful members would survive and perpetuate their kind and the useless and criminal members would be exterminated."

In so far as socialists rid themselves of their sentimental and Utopian equalitarianism, eugenists should join them eagerly in a demand that the distribution of wealth be made to depend *as far as feasible on the value of the individual to society*. As to the means by which this distribution can be made and the degree of compromise which is of course necessary in providing for the economically incompetent from youth, old age, and other incapacity, there will of course be differences of opinion, to discuss which would be outside the province of this volume. Fundamentally, eugenics is anti-individualistic and in so far a socialistic movement, since it seeks a social end involving some degree of individual subordination. This fact would be more frequently recognized if the movement which claims the name of socialist did not so often lean over backward in its "will to believe" that environmental change can eliminate inborn inequalities.

#### CHILD LABOR

It is often alleged that the abolition of child labor would be a great eugenic accomplishment. The children who labor mostly come from poor families, where every child up to the age of economic productivity is an economic burden. If the children go to work at an early age, the parents can afford to have more children and probably will, since the children soon become to some extent an asset rather than a liability. Child labor thus leads to a higher birth-rate of this class; abolition of child labor would lead to a lower birth-rate, since the parents could no longer afford to have so many children.

Karl Pearson traced this result statistically in the birth-rate of English working people. A considerable decline in their fecundity, due to voluntary restriction, began after the passage

of each of the laws which restricted child labor and made children an expense from which no return could be expected.

If the abolition of child labor leads to the production of fewer children in a certain section of the population the value of the result to society, in this phase, will depend on whether or not society wants that strain proportionately increased. If it is an *inferior stock*, this one effect of the abolition of child labor would be eugenic.

Comparing the families whose children work with those whose children do not, the evidence elsewhere considered would indicate that the former average inferior to the latter. If so, child labor is in this one particular aspect dysgenic, and its abolition, leading to a lower birth-rate in this class of the population, will be an advantage. The desirability of prohibiting child labor is generally conceded on euthenic grounds, and we conclude that there will be eugenic results as well.

#### TRADES UNIONISM

A dysgenic feature often found in trades unionism is involved in our discussion of the minimum wage (see the succeeding chapter). The union tends to standardize wages, fixing a rate of pay in a given industry and demanding that nearly all workers in that classification be paid the same wage. It has in many instances opposed time studies and other efficiency methods. It can not be denied that some of the workers are much more capable than others. Artificial interference with a more exact *adjustment of wages to ability* therefore penalizes the better workmen and subsidizes the worse ones. Economic pressure is thereby put on the better men to have fewer children, and the less efficient are encouraged to have more children than they would be able to afford if their incomes more nearly represented their real worth. Payment according to actual production (measured both quantitatively and qualitatively), with prizes and bonuses to which the unions are in general unsympathetic, is more in accord with the principles of eugenics. Fortunately the objectionable features of trades unionism (aptly called by Perl-



man "job communism") are not essentials and could be eliminated without injury to the valuable features of the movement.

#### COMPULSORY EDUCATION

Whether one favors or rejects compulsory education will probably be determined by other considerations than those derived from eugenics; nevertheless there are eugenic aspects of the problem which deserve to be recognized.

One of the effects of compulsory education is similar to that which follows the abolition of child labor—namely, that the child is made a source of expense, not of revenue, to the parent. Not only is the child unable to work, while at school, but to send him to school involves in practice dressing him better than would be necessary if he stayed at home. While it might fit the child to work more gainfully in later years, yet the years of gain are so long postponed that the parent can expect to share in but little of it, especially as the family is becoming increasingly individualistic so far as responsibility of children goes.

These arguments would not affect the well-to-do parent, or the high-minded parent who was willing or able to make some sacrifice in order that his children might get as good a start as possible. But they may well affect the opposite type of parent, with low efficiency and low ideals. This type of parent, finding that the system of compulsory education made children a liability, not an immediate asset, would thereby be led to reduce the size of his family, just as he seems to have done when child labor was prohibited in England and children ceased to be a source of revenue. Compulsory education has here, then, a eugenic effect in discouraging the reproduction of parents with the least efficiency and altruism.

If this belief be well founded, it is likely that any measure tending to decrease the cost of schooling for children will tend to diminish this effect of compulsory education. Such measures as the free distribution of textbooks, the provision of free lunches at noon, or the extension to school children of a reduced

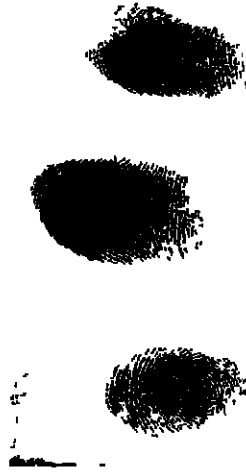
car-fare, make it easier for the selfish or inefficient parent to raise children; they cost him less and therefore he may tend to have more of them. If such were the case, the measures referred to, despite the euthenic considerations, must be classified as dysgenic.

*In another and quite different way, compulsory education is of service to eugenics. The educational system should be a sieve, through which all the children of the country are passed—or more accurately, a series of sieves, which will enable the school administration to determine just how far it is profitable to educate each child so that he may lead a life of the greatest possible usefulness to the state and happiness to himself. Obviously such a function would be inadequately discharged, if the sieve failed to get all the available material, and compulsory education makes it certain that all will be measured, provided the school system is efficient enough to make diagnosis and prognosis two of its major functions.*

It is very desirable that no child escape inspection, because of the importance of discovering every individual of exceptional ability or inability. Since the public educational system has not yet risen to the need of this systematic mental diagnosis, private philanthropy should for the present be alert to get appropriate treatment for the unusually promising individual. In Pittsburgh, a committee of the Civic Club is seeking youths of this type, who might be obliged to leave school prematurely for economic reasons, and is aiding them to appropriate opportunities, through the coöperation of the Bahl Foundation, Phi Beta Kappa, and other organizations. Such discriminating selection will probably become a recognized function of the schools. Compulsory education is necessary for this selection.

We conclude that compulsory education, as such, is not only of service to eugenics through the selection it makes possible, but may serve in a more unsuspected way by cutting down the birth-rate of inferior families

FIG. 39.—Accurate genealogical records and personal identification are eugenically indispensable. If the infant's foot-print is taken at birth and his mother's finger prints taken at the same time on the same card, there can not in the future be any mistake about maternity. The fat little foot is not easily printed, but with some care a good impression can be got, which can be read easily with a hand lens. The large creases conspicuous in the sole of the foot help to identify the infant during the first few months of life but they then disappear except in special cases such as that of the so-called Mongolian imbecile. The friction-skin pattern is permanent and unalterable. Prints (natural size) from the Pasadena Hospital



NO DOUBT ABOUT WHO OWNS THIS BABY

## VOCATIONAL GUIDANCE AND TRAINING

In arguments for vocational guidance and education of youth, one does not often hear eugenics mentioned; yet these measures, if effectively carried out, are of real eugenic value.

The need for as perfect a correlation as possible between income and eugenic worth, has been already emphasized. It is evident that if a man gets into the wrong job, a job for which he is not well fitted, he may make a very poor showing in life, while if properly trained in something suited to him, his income would have been considerably greater. It will be a distinct advantage to have superior young people get established earlier, and this can be done if they are directly taught efficiency in what they can do best, the boys being fitted for gainful occupations, and the girls for wifehood and motherhood in addition.

As to the details of vocational guidance, eugenics may offer the suggestion that a minor factor might be contributed by a more thorough study of the inheritance of ability. It was pointed out in Chapter IV that inheritance often seems to be highly specialized,—a fact which leads to the inference that the son might often do best in his father's calling or vocation, especially if his mother comes from a family marked by similar capacities. It is difficult to say how far the occupation of the son is, in modern conditions, determined by heredity and how far it is the result of chance, or the need of taking the first job open, the lack of any special qualifications for any particular work, or some similar environmental influence. Miss Perrin investigated 1,550 pairs of fathers and sons in the English *Dictionary of National Biography* and an equal number in the English *Who's Who*. "It seems clear," she concluded, "that whether we take the present or the long period of the past embraced by the Dictionary, the environmental influences which induce a man in this country to follow his father's occupation must have remained very steady." She found the coefficient of contingency between occupation of father and occupation of son in *Who's Who* to be .75 and in the *Dictionary of National Biography* .76.

For the inheritance of physical and mental characters, in general, the coefficient would be about .5. She thinks, "therefore, we may say that in the choice of a profession inherited taste counts for about  $\frac{2}{3}$  and environmental conditions for about  $\frac{1}{3}$ ."

An examination <sup>188</sup> of 990 seventh and eighth grade boys in the public schools of St. Paul showed that only 11% of them desired to enter the occupation of their fathers; there was a pronounced tendency to choose occupations of a more remunerative or intellectual and less manual sort than that followed by the father. That this preference would always determine the ultimate occupation is not to be expected, as a considerable per cent may fail to show the necessary ability.

While inherited tastes and aptitude for some calling probably should carry a good deal of weight in vocational guidance, we can not share the exaggerated view which some sociologists hold about the great waste of ability through the existence of round pegs in square holes. This attitude is often expressed in such words as those of E. B. Woods: <sup>188</sup> "Ability receives its reward only when it is presented with the opportunities of a fairly favorable environment, its peculiarly indispensable sort of environment. Naval commanders are not likely to be developed in the Transvaal, nor literary men and artists in the soft coal fields of western Pennsylvania. For ten men who succeed as investigators, inventors, or diplomatists, there may be and probably are in some communities fifty more who would succeed better under the same circumstances."

While there is some truth in this view, it exaggerates the evil by ignoring the fact that good qualities frequently go together in an individual. The man of Transvaal who is by force of circumstances kept from a naval career is likely to distinguish himself as a successful colonist, and perhaps enrich the world even more than if he had been brought up in a maritime state and become a naval commander. It may be that his inherited talent fitted him to be a better naval commander than anything else; if so, it probably also fitted him to be better at many other things, than are the majority of men. "Intrinsically

good traits have also good correlatives," physical, mental, and moral.

F. A. Woods has brought together the best evidence of this in his studies of the royal families of Europe. If the dozen best generals were selected from the men he has studied, they would of course surpass the average man enormously in military skill; but, as he points out, they would also surpass the average man to a very high degree as poets—or doubtless as cooks or lawyers, had they given any time to those occupations.

The above considerations lead to two suggestions for vocational guidance: (1) it is desirable to ascertain and make use of the child's inherited capacities as far as possible; but (2) it must not be supposed that every child inherits the ability to do one thing only, and will waste his life if he does not happen to get a chance to do that thing. It is easy to suppose that the man who makes a failure as a paperhanger might, if he had had the opportunity, have been a great electrical engineer; it is easy to cite a few cases, such as that of General U. S. Grant, which seem to lend some color to the theory, but statistical evidence indicates that it is not the rule. If a man makes a failure as a paperhanger, it is at least possible that he would have made a failure of very many things that he might try; and if a man makes a brilliant success as a paperhanger, or railway engineer, or school teacher, or chemist, he is a useful citizen who would probably have gained a fair measure of success in any one of several other occupations that he might have taken up.

A knowledge of heredity and eugenics is essential to good vocational guidance. Such guidance must vary with the type of intelligence, whether abstract (verbal), mechanical, or social; with the type of temperament, whether introvert or extrovert; as well as with the special inherited aptitudes already mentioned. It must likewise take into account in every case the need of preparation for marriage and family life.

To sum up: vocational guidance and training are likely to be of much service to eugenics. They may derive direct help from heredity; and their exponents may also learn that a man

who is really good in one thing is likely to be good in many things, and that a man who fails in one thing would not necessarily achieve success if he were put in some other career. One of their greatest services will probably be to direct more boys into skilled trades, for which they are adapted and where they will succeed, and thus prevent them from yielding to the desire for a more genteel clerical occupation, in which they will not do more than earn a bare living. This will assist in bringing about the higher correlation between merit and income which is so much to be desired.

#### FEMINISM

The word "feminism" might be supposed to characterize a movement which sought to emphasize the difference between the two sexes and claimed special provisions to meet women's special needs. It was so used in early days on the continent. But at present in England and America it denotes a movement which is practically the reverse of this; which seeks to remove all discrimination based on sex. The feminists variously demand that woman be recognized as the equal of man (1) biologically, (2) politically, (3) economically.

1. Whether or not woman is to be regarded as biologically equal to man depends on how one uses the word "equal." If it is meant that woman is as well adapted to her own particular kind of work as is man to his, the statement will readily be accepted. Unfortunately, feminists show a tendency to go beyond this and to minimize differentiation in their claims of equality. An attempt is made to show that women do not differ materially from men in the nature of their capacity of mental or physical achievement. Mrs. Charlotte Perkins Gilman makes the logical application by demanding that little girls' hair be cut short and that they be prevented from playing with dolls in order that differences fostered in this way be reduced.

In forming a judgment on this proposition, it must be remembered that civilization covers not more than 10,000 years out of man's history of half a million or more. During 490,000

out of the 500,000 years, man was the hunter and warrior, while woman stayed at home of necessity to bear and rear the young, to skin the prey, to prepare the food and clothing. He must have a small knowledge of biology who could suppose that this long history would not lead by natural selection to any differentiation of the two sexes. If this were not enough, one has only to remember that women differ from men in every cell of their bodies, in basal metabolism, in constitutional vitality, in structure and in function, in glandular make-up and in emotional equipment, to be certain that the two sexes must react differently in many respects. This does not mean that there is not much overlapping. Every one knows men who are markedly feminine in many ways, women who are markedly masculine. But the central tendencies of the two sexes are distinct in some respects.

It is worth noting that the spread of feminism will reinforce the action of sexual selection in keeping down the numbers of this "intermediate sex." In the past, women who lacked femininity or desire for motherhood have often married because the pressure of public opinion and economic conditions made it uncomfortable for any woman to remain unmarried. And they have had children because they could not help it, transmitting to their daughters their own lack of maternal desire. Under the new régime a large proportion of such women do not marry, and accordingly have few if any children to inherit their defects. Hence the average level of maternal feeling of the women of America is likely to rise steadily.

We conclude that any claim of biological equality of the two sexes must use the word in a figurative sense, not ignoring the differentiation of the two sexes, as extreme feminists are inclined to do. To this differentiation we shall return later.

2. Political equality includes the demand for the vote and for the removal of various legal restrictions, such as have sometimes prevented a wife from disposing of her own property without the consent of her husband or such as have made her citizenship follow that of her husband. In the United States,



most of these legal restrictions have been removed at such a rate that in a few states it is now the husband who has a right to complain of certain legal discriminations.

The equal suffrage has also been accepted, but its eugenic aspect is not wholly clear. Theoretically, much is to be hoped from it, as making use of woman's large social sympathies and responsibilities and interest in the family; but in actual trial, its effects have not been all that was expected. Beneficial results may still be hoped for unless an objectionably extreme feminism finds support.

In general, the demand for political equality, in a broad sense, seems to the eugenicist to be the most praiseworthy part of the feminist program. The abolition of those laws, which now discharge women from positions if they marry or have children, promises to be in principle a particularly valuable gain.

3. Economic equality is often summed up in the catch phrase "equal pay for equal work." If the phrase refers to jobs where women are competing on piecework with men, no one will object to it. In practice it applies particularly to two distinct but interlocking demands: (a) that women should receive the same pay as men for any given occupation—as, stenography, for example; and (b) that childbearing should be recognized as just as much worthy of remuneration as any occupation which men enter, and should be paid for (by the state) on the same basis.

At present, there is almost universally a discrimination against women in commerce and industry. They sometimes get no more than half as much pay as men for similar grades of employment. But for some of this there is good reason. An employer needs experienced help, and he expects a man to remain with him and become more valuable. He is, therefore, willing to pay more because of this anticipation. In hiring a woman, he thinks she may soon leave to marry. But whatever may be the origin of this discrimination, it is justified in the last analysis by the fact that a man is paid as the head of a family, a woman only as an individual who ordinarily has

fewer or no dependents to support. Indeed, it is largely this feature which, under the law of supply and demand, has caused women to work for lower wages

It is evident that real economic equality between men and women must be impossible except in a socialist society if the women are to leave their work for long periods of time, in order to bear and rear children. It is normally impossible for a woman to earn her living by competitive labor, at the same time that she is bearing and rearing children. Either the doctrine of economic equality is largely illusory, therefore, or else it must be extended to making motherhood a salaried occupation just as much as millwork or stenography

The feminist attitude on this point is uncertain. Many maintain that the care of a modern home is so far beneath the scope of an intelligent woman's full attention that she can easily hold a full-time job with it, getting an occasional vacation for child-bearing. Many of them go further and assert that this is now being done. The census of 1930 showed that one in eight of the nation's home-makers is now gainfully occupied. Of those who are employed, about one-fifth are employed on work at home, while four-fifths work away from home. Of those who work away from home, the largest number are in the group designated as servants, waitresses, etc., the second largest proportion were classified as industrial workers, and the third as office workers. While no figures are given, it is probable that many of these are childless.

Of the gainfully employed home-makers, one in every 11 was reported as a professional worker. Presumably most of these were teachers, since that occupation attracts more women than any other except servant.

The feminist contention that it is feasible for any intelligent woman to have a career and a family at the same time may be tested by examining the records<sup>18</sup> of the women included in *Who's Who in America*. By far the largest group are authors, with artists, social workers, educators, professional women following in order. Of the entire group 53% have been

married; they married a year later than the average college woman and three years later than other women of equal social standing. The average number of children is 1.12 per married woman. Almost all in this list are beyond the age of motherhood. It is clear that, by actual test, a career such as leads to inclusion in *Who's Who* is associated with such a low rate of fecundity as to lead rapidly to extinction of the group.

A still more highly selected group is that published a few years ago by Ida M. Tarbell, as representing her selection of the fifty foremost contemporary American women. Miss Tarbell's own name should be added to the number. The eugenic status of the members of this list, at the time it was published, was as follows:

*Unmarried*

Abbott, Grace	Draper, Ruth	Morgan, Anne
Addams, Jane	Ernberg, Anna	Oakley, Violet
Allen, Florence	Gildersleeve, Virginia	Perkins, Frances
Anderson, Mary	Gilson, Mary	Roche, Josephine
Beaux, Cecilia	Hamilton, Alice	Sabin, Florence R.
Berry, Martha	Keller, Helen	Thomas, M. Carey
Burchenal, Elizabeth	Kingsbury, Susan M.	Van Kleeck, Mary
Cannon, Annie Jump	Lathrop, Julia	Van Rensselaer, Martha
Cather, Willa Sibert	Le Gallienne, Eva	Wald, Lillian D.
Comstock, Ada	Livingston, Rose	Wooley, Mary T.
Davis, Katherine B.	Marbury, Elizabeth	(add, Ida M. Tarbell)

*Married, No Children*

Austin, Mary	Huntington, Mrs. Archer
Booth, Maud Ballington	Lane, Gertrude
Catt, Carrie Chapman	Millay, Edna St. Vincent
Crothers, Rachel	Moody, Helen Wills
Dillon, Mary	Wharton, Edith
Earhart, Amelia	Whitney, Mrs. Harry Payne
Fiske, Minnie Maddern	

*Married, with Children*

Bethune, Mary McLeod	1
Gilbreth, Mrs. Lillian	12
Homer, Louise	6
Kelley, Florence	1
Sanger, Margaret	2
	<hr/>
	22

One woman alone, it will be noted, had more children than all the other fifty put together. It must be concluded that under contemporary conditions women are not successfully associating careers with motherhood. Whether this is an inevitable condition, has been discussed in Chapter XV.

There is good ground for the feminist contention that women should be liberally educated, that they should not be regarded by men as inferior creatures, that they should have the opportunity of self-expression in a richer, freer life than they have had in the past. All these gains can be made without sacrificing any racial interests; and they should be so made. The unrest of intelligent women is not to be lessened or removed by educating them in the belief that they are not different from men and setting them to work as men in the work of the world. The true solution is rather to be sought in recognizing the natural differentiation of the two sexes and in emphasizing this differentiation by education. Boys will be taught the nobility of being productive and of establishing families, girls will have similar ideals held up to them but will be taught to reach them in a different way, through cultivation of the intellectual and emotional characters most useful to that division of labor for which they are supremely adapted, as well as those that are common to both sexes. The home must not be made a subordinate interest, as some feminists and most communists desire, but it must be made a much richer, deeper, more satisfying interest than it too frequently is at present.

#### URBANIZATION

The increase in population of cities has gone on from decade to decade until, in the census of 1930, an actual majority of the American people lived in communities of more than 2,500 population. It is generally agreed that this trend is continuing steadily. There is in normal years a migration from country to city, which is only partly offset by the return movement from city to country. The rapid growth of many cities has not been due so much to migration from the surrounding coun-

try as to migration from other cities, migration from foreign countries, and extension of urban areas by incorporation of suburbs. Nevertheless, the steady movement from farms to towns has been a feature of American life, as it has in most other civilized nations, for a century or more.

Since the birth-rate of people living on farms is uniformly higher than the birth-rate of people living in cities, a comparison of the eugenic quality of the two populations is of the greatest importance. Many such studies, direct and indirect, indicate that the city population contains more ability than the country population. The facts are so obscured by the presence of foreign-born immigrants in some regions, and the correlations with social and economic status, that they are easily subject to misinterpretation. If these factors are kept constant, the differences between city and country are probably not as large as has often been supposed.<sup>2</sup> But in view of the greater rewards offered to ability in cities, the greater attractions and excitement presented to young people, and the unsatisfactory economic situation of agriculture during a large part of the past generation, it is probable that there is a steady drainage of ability from the farms to the cities.

Statistically, the chance of marriage is 10% less in the city than in the country.<sup>62</sup> Since the birth-rate is also lower, marriages occur at later ages, and there is often a higher rate of infant mortality, the result of urbanization is definitely dysgenic. Efforts to change this dysgenic result may be directed along two lines.

1. Measures may be adopted to secure a higher and eugenically more favorable birth-rate in the city populations. Since most of this book is devoted to a discussion of such measures, it is not necessary to rehearse them here.

2. Measures may be adopted to conserve the population values of the country areas, and even to bring back from the cities some of their more desirable elements, into the superior environment of the farms.

Fortunately, the growing discomforts of crowding in large

cities provide an aid to measures under the second heading. While the census of 1930 showed a continuing trend from farms to cities, it also showed a trend away from the centers of the cities into the suburbs. An extension of this trend may bring about, as many economists and city planners foresee, a decentralization of large cities with the establishment of their industries in smaller centers where, among other things, living conditions are much more favorable and family life will be carried on under more desirable conditions. The present organization of great cities developed with the application of steam power to industry and transportation, and it is in many respects either unnecessary or unfavorable in a period when electricity has largely taken the place of steam. A break-up of the cities and a scattering of their population over larger areas would be accompanied by reduction of expenses of manufacture, transportation, and business, together with increased efficiency of labor. Their continued growth seems to be due as much to inertia as to anything else. Their break-up would probably promote the health and general culture of their inhabitants, as well as being of inestimable value to family life.<sup>182</sup>

But it is impossible to depend upon such an eventuality, and greater effort should be exerted at the present time to make farm life more attractive and remunerative, and thus keep the more energetic and capable young people on the farms. Due to the farmers' lack of unity and "collective bargaining power," so to speak, there has been a tendency to favor the cities in economic and social measures, including education, and in particular a type of education developed in the cities has been forced back on the rural schools. It was inappropriate enough in the cities, but entirely out of place in the country. From a eugenic point of view, widespread changes in education, industry, and social organization, deliberately favoring the country even at the expense of the city, would be justified.

While the moves in this direction have so far been pitifully inadequate, there are at least some promising ones, such as the investigations of the Vermont Commission on Country Life,

the purposes of which are "to discover what hindrances are met in rural communities, preventing the fullest expression of the inherited abilities of the people, to appraise work now being done by towns, state departments, clubs, churches, etc., to improve the environment, to overcome the hindrances, and to offer adequate opportunities for training and for the choice of vocations, to draw up a unified, workable, state-wide plan for rural betterment." Since this movement was organized (in 1928) by the Eugenics Survey of Vermont, under the direction of H. F. Perkins, the eugenic point of view was maintained throughout. Conclusions which emerged from this survey included a determination that the present rural population is not inferior to its antecedents, and the inauguration of many measures to insure better organization of adult education, reallocation of political boundaries, and the development of a different point of view among the people.

The desire of some city-bred economists to reach out and seize the rural areas for "industrialization," consolidating farms in immense units owned by corporations and worked by hired labor, is particularly out of line with the spirit of American culture and the requirements of a sound eugenic policy. Farm life must be looked upon not as a way of piling up a fortune, but as a form of life which, in its adaptation to human nature, in its cultural significance, and in its yielding of real satisfactions, is superior to that of a machine civilization. It must be fostered and conserved on this basis.

Restriction of immigration of foreign agricultural labor with a low standard of living and low cultural organization is particularly important. For this reason the influx of Mexicans, Filipinos, and others that have gone into agriculture in the present century was particularly unfavorable to the development of a sound rural life. Education of native white Americans for farm life would have been a more profitable national policy.

With free ascent assured for every individual in society, according to his merits, with assortative mating and a normal

birth-rate in the superior part of the population, together with some decrease in the production of handicapped and mentally deficient children, there will be in each generation an increased supply of children with good intelligence. These will form a stream that will tend to flow downward from the upper layers of the social pyramid, and to take the places of some of those who hold their jobs at the present time merely because of the lack of qualified persons.

Such a result will raise the mean I.Q. of the entire population, will probably make room in the economic structure for more people with superior I.Q.'s, and will provide the basis of a better citizenship. It would, in particular, provide a continual stream of men and women of ability for the farms. The farming population of the United States is by no means drained of superior ability, as is to a larger extent the peasant class of Great Britain or of Europe.<sup>6</sup> Its continual replenishment, instead of continual depletion, would strengthen it and give it a greater political weight than it now has.

It is doubtful whether any other one change would be more productive of eugenic improvement than would a general strengthening of the bases of farm life in the United States.



## CHAPTER XVIII

### THE EUGENIC ASPECT OF SOME EUTHENIC MEASURES

#### 2. ECONOMIC

Taxation has been used in many countries and ages, as a means of influencing the birth-rate. The fact that births are markedly affected by economic factors makes this a natural line of procedure.

To be just, any form of taxation should repress productive industry as little as possible, and should be of a kind that can not be shifted easily. In addition to these requirements, it should if possible contribute directly to the eugenic strength of the nation by favoring, or at least by not penalizing, superior families.

A heavy tax on land values (in extreme, the single tax of Henry George) has been proposed as likely to be eugenic in effect, because reducing unearned incomes and correspondingly lightening the load on earned incomes. But it would be less eugenic than taxes which are more directly correlated with the traits of the individual, such as the income tax, where the incidence can be nicely adjusted according to some guiding principle.

A tax on bachelors is proposed as a means of getting bachelors to marry, but is this always desirable? It depends on the quality of the bachelors. Even at present, there is abundant evidence proving that the married men of the population are on the whole superior in almost every way to the unmarried men. As the action of sexual selection is still further improved by eugenic education, this difference in quality will increase. It will then be an advantage that the bachelors stay single, and a tax which would force them into marriage and therefore possible parenthood merely for reasons of economy, would be

likely to result in a eugenic loss. A moderate tax on unmarried persons of both sexes, merely for the purpose of equalizing the burdens, is legitimate, but this can best be made indirectly by exemptions of those with families, as hereinafter described.

European countries which have adopted the tax on the unmarried tend to make the imposition fairly heavy. France puts a surtax of 25% on their income, Italy one of 50%, while the latter country imposes a poll tax in addition, which was doubled by the law of 1928. This amounts to L.70 per year for the citizen between 25 and 35, L.100 per year between the ages of 35 and 50, when his (or her) earning capacity is presumably highest, and L.50 between the ages of 50 and 65.

The inheritance tax seems particularly useful from a eugenic point of view. Very large inheritances should be taxed to a much greater degree than is at present attempted in the United States, and the tax should be graded not on the total amount of the inheritance, but on the amount received by each individual beneficiary.

Liberal use has been made of the inheritance tax as a means of population control, at least since the time of Augustus. The French law, in force since the time of Napoleon I, according to which an estate must be divided equally among the children, has often been described as one of the main factors in the low birth-rate of that country. The small farmer with a few acres of ground would leave his sons, if numerous, such small patrimonies as to be useless. He attempts, therefore, to have only one son, in order that the estate may go down without division. And in the absence of any law, there is a similar result in other countries, since a man with a small estate feels that it will be an important legacy to one child, but will be of little value if divided among half a dozen. In England, this difficulty was obviated by primogeniture, according to which the eldest son received the estate and the younger ones got, and expected to get, little or nothing. This of course introduces a new dysgenic aspect since it interferes with the attempt to make wealth correlated with individual worth.

Reformers have generally proposed to place limitations on the right of inheritance, according to the number of heirs. The details of each proposal vary with the proponent, but the general principle is the same. It is proposed that families large enough to perpetuate themselves be exempted from inheritance tax, and the estate be divided equally among the heirs. Suppose that each estate, above a certain minimum, be divided into five imaginary shares. If a man dies unmarried, all five parts go to the state. If he leaves a widow but no children, she receives one part and the other four go to the state. If he leaves a widow and one child, each of these gets a part while the state gets three parts. Each additional child gets one-fifth, so that if a widow and four (or more) children survive the decedent, the state gets nothing. Such a plan, it is argued, would encourage well-to-do families to have more children by giving them the opportunity to keep the entire property in the family in this way. The large sums derived from the heavy inheritance taxes on the childless and the small families could be used to equalize in other ways the burden placed on large families.

There are obvious difficulties in the way of such a plan. If an estate consists of a factory, for instance, it would be hard to divide it into five parts; the state certainly would not want to take over say three-fifths of a cement plant, while the heirs kept the other two-fifths; and the liquidation of estates continually in this way by forced sales, in order to satisfy the inheritance tax, would be ruinous to industry. These difficulties might be surmounted, but for the present a less drastic plan would probably serve.

In Italy since 1930 an estate pays no inheritance tax if there are two or more children. In France an estate left to two children pays twice as much, an estate left to a single child pays three or four times as much, as does an estate divided between three or more children. Another limitation sometimes, and wisely, added, as in several American states, is to increase the tax according to the remoteness of kin of the heirs. Thus an

estate left to sons or daughters is much less heavily taxed than one left to an adventuress or a spiritualist medium.

The details of a workable inheritance law must be left to experts on taxation. The sum exempted should not be large enough to tempt the beneficiary to give up work and settle down into a life of complacent idleness, but enough to be of decided assistance to him in bringing up a family. Provisionally, \$50,000 would be a good maximum exemption. Above this the rate should advance rapidly and should be progressive, not proportional. A tax of 50% or 75% on very large estates does not seem excessive, since large inheritances tend to interfere with the correlation of wealth and social worth, which is so necessary from a eugenic point of view as well as from that of social justice. Of course the effective operation of such a measure depends upon the abolition of tax-exempt securities.

To go further, as has often been done, and suggest that inheritances be confiscated altogether by the government, shows a lack of appreciation of the value of a reasonable right to bequeath, in encouraging larger families among those having a high standard of living. It is not desirable to deter from reproduction the kind of strains which possess directing talent and constructive efficiency; and they would certainly be deterred if a man felt that no matter how hard he might strive, he could not leave any of his accumulations to those who were to continue his stock.

The income tax is used in almost every country as a means of recognizing family burdens, but it should be made more selective than at present. Changes in it, however, encounter the conflict between two opposing schools of taxation which, in the United States, have alternated in impressing their ideas on legislation. One holds that the way to collect the largest amount of revenue is to "soak the rich," to have the surtaxes rise much more steeply, and to exempt small incomes more liberally. The other holds that this is largely a demagogic policy which in fact defeats its own purpose, because the large incomes of the very rich are relatively few in number, and are used mainly

for the maintenance of business and industry. If the latter are hampered by the cutting off of the large incomes which keep them going, the great body of wage earners will in the long run suffer much more than could be offset by the moderate lightening of its own tax burdens which would result from heavier surtaxes on large incomes. Each side exaggerates its claims and neither one takes account of the eugenic aspect.

The technical difficulties of working out a successful income tax are therefore great. From a eugenical point of view, it would be highly desirable to exempt from taxation all incomes of married people below a certain critical sum, this amount being the point at which a change of income may be supposed not to affect size of family. Prolonged research would be necessary to determine this point, it may be put provisionally at exemption of all incomes under \$2,000, and additional exemption of \$2,000 for a wife, \$2,000 for each minor child, and above these a steeply graded advance, on some such schedule as that which existed in the United States after the World War. Few specialists on taxation are willing at the present time to accept such exemptions, because of the large reduction in the revenue that would result. On the other hand, it must be recognized that exemptions for children, such as have existed in recent years, are of more moral or psychological value than of real financial aid. An exemption of \$400 income for a child sounds well but when reduced to the actual change in one's taxes, it means only \$8 or \$10 to most fathers. Obviously such an amount bears little relation to the cost of rearing a child.

A more direct means of equalizing this burden through the family wage has been discussed in Chapter XV.

There is an obvious eugenic advantage in heavy taxes on harmful commodities and unapprovable luxuries.

#### THE MINIMUM WAGE

Legal enactment of a minimum wage is often urged as a measure that would promote social welfare and race betterment. By minimum wage is to be understood, according to its

advocates, not the wage that will support a single man, but one that will support a man, wife, and three or four children. In the United States, the sum necessary for this purpose can hardly be estimated at less than \$2.50 a day.

A minimum living wage is desirable for every man, but the idea of giving every man a wage sufficient to support a family can not be considered eugenic. In the first place, it interferes with the adjustment of wages to ability, on the necessity of which we have often insisted. In the second place, it is not desirable that society should make it possible for every man to support a wife and three children, in many cases it is desirable that, in one way or another, it be made impossible for him to do so. Eugenically, teaching methods of birth control to the married unskilled laborer is a sounder way of solving his problems, than subsidizing him so he can support a large family.

It must be frankly recognized that poverty is in many ways eugenic in its effect, and that with the spread of birth control among people below the poverty line, it is certain to be still more eugenic than at present. It represents an effective, even though a cruel, method of keeping down the net birth-rate of people who for one reason or another are not economically efficient; and the element of cruelty, involved in high infant mortality, will be largely mitigated by birth control. Free competition may be tempered to the extent of furnishing every man enough charity to feed him, if he requires charity for that purpose; and to feed his family, if he already has one; but charity expressly planned to allow him to increase his family, if he is too inefficient to support it by his own exertions, is generally dysgenic.

The minimum wage on the family basis is admittedly not an attempt to pay a man what he is worth. It is an attempt to make it possible for every man, no matter what his economic or social value, to support a family. Therefore, in so far as it would encourage men of inferior quality to have or increase families, it is unquestionably dysgenic. A minimum wage on an individual basis is not objectionable eugenically.

## MOTHERS' PENSIONS

Most of the states of the Union have adopted some form of pension for widowed mothers. In general, these laws apply to mothers who are widows, or in some cases to those who have lost their means of support through imprisonment or incapacity of the husband. The maximum age of the child on whose account allowance is made varies from 14 to 16, in a few cases to 17 or 18. The amount allowed for each child varies in each state, approximately between the limits of \$100 and \$200 a year. In most states the law demands that the mother be a fit person, physically, mentally, and morally to bring up her children, and that it be to their interest that they remain with her at home instead of being placed at work or sent to some institution. In all cases considerable latitude is allowed the administrator of the law—a juvenile court, or board of county commissioners, or some body with equivalent powers.

Laws of this character have often been described as being eugenic in effect, but examination shows little reason for such a characterization. Since the law applies for the most part to women who have lost their husbands, it is evident that it is not likely to affect the differential birth-rate which is of such concern to eugenics. On the whole, mothers' pensions must be put in the class of work which may be undertaken on humanitarian grounds, but they are probably slightly dysgenic rather than eugenic, since they favor the preservation of families which are, on the whole, of inferior quality, as shown by the lack of relatives with ability or willingness to help them. On the other hand, they are not seriously dysgenic, as they are not likely to result in the production from these families of more children than those already in existence.

## OLD AGE PENSIONS

Pensions for aged people form an important part of the modern program of social legislation. What their merits may be in relieving poverty will not be discussed here. But beyond the

direct effect, it is important to inquire what indirect eugenic effect they would have, as compared with the present system where the aged are most frequently supported by their own children when they have failed through lack of thrift or for other reasons to make provision for their old age.

The ordinary man, dependent on his daily work for a livelihood, can not easily support his parents and his offspring at the same time. Aid given to the one must be in some degree at the expense of the other. The eugenic consequences will depend on what class of man is required to contribute thus to parental support

It is at once obvious that superior families will rarely encounter this problem. The parents will, by their superior earning capacity and the exercise of thrift and foresight, have provided for the wants of their old age. A superior man will therefore seldom be under economic pressure to limit the number of his own children because of the necessity of supporting his parents. In inferior families, on the other hand, the parents will have made no adequate provision for their old age. A son will have to assume their support, and thus reduce the number of his own children—a eugenic result. With old age pensions from the state, the economic pressure would be taken off these inferior families and the children would thus be encouraged to marry earlier and have more children—a dysgenic result.

From this point of view, the most eugenic course would perhaps be to make the support of parents by children compulsory, in cases where any support was needed. Such a step would not handicap superior families, but would hold back the inferior. A contributory system of old age pensions, for which the money was provided out of the individual's earnings, and laid aside for his old age, has a comparable effect. A system which led to the payment of old age pensions by the state would be harmful but the degree would depend on the system of taxation used. If paid by the employer, the cost is added to the price of goods and is thus raised as a sales tax, one of the inferior methods of taxation and hence not to be approved.



The latter system would be evil in still another way because, as is the case with most social legislation of this type, the funds for carrying out such a scheme must naturally be furnished by the efficient members of the community. This adds to their financial burdens and encourages the young men to postpone marriage longer and to have fewer children when they do marry—a dysgenic result.

It appears, therefore, that old age pensions paid by the state or employer solely would be dysgenic in a number of ways, encouraging the increase of the inferior part of the population at the expense of the superior. Since there are strong euthenic grounds for old age pensions they should be contributed partly as a deduction from wages and partly by the state in proportion to the kind of taxation system used.

#### HOUSING

Few conditions in large cities are more harmful to the family than the lack of adequate housing at a reasonable price.

1. In the first place, the family sometimes can not get accommodations at all, in the part of the city where it may otherwise be desirable or convenient to live. Inquiry among 500 apartment owners in Los Angeles, to find whether they would rent an apartment to a young couple with a six-months-old baby, revealed that the infant was a complete bar to tenancy in an actual majority of cases (though some who excluded the baby were quite willing to accept a dog instead) and that, on the whole, those that would accept a baby were in the less fashionable parts of the city, or were less modern, less desirable buildings. If one small baby excludes a family from a majority of apartment houses, what can be expected by the eugenic family of four or five lively children? Of course it is agreed that an apartment house is not a proper place to bring up a family, in any event, but it is almost the only housing available in many areas.

Such a situation tends to discourage parenthood, on the part of young couples who come of good families and desire to live

in the part of the city where their friends are to be found. It at least tends to cause postponement of parenthood until they feel financially able to take a separate house. Here is an influence tending to lower the birth-rate of young couples who have social aspirations, at least to the extent of desiring to live in the pleasanter and more reputable part of their city. Such a hindrance exists to a much less extent, if at all, for those who have no reason for wanting to live in the fashionable part of the city. This discrimination of some apartment owners against families with children would therefore appear to be dysgenic in its effect.

2. The expense of housing in cities is also one of the severest kinds of economic pressure tending to keep down the size of family among people who have reasonably high standards of living. Economists agree that this expense is much greater than necessary, and due to uneconomic practices of various kinds such as lack of adequate planning for development of new land, overbuilding, speculative building which involves excessive speculative profits, lack of proper provision for zoning, transportation, and the like.

3. The effects of overcrowding have not been analyzed adequately, and it is impossible to separate out the various elements that are interrelated: poverty, racial factors, high infant mortality, low intelligence, disease, physical disability. If any useful results ensue eugenically, they can be obtained at much less cost in some other way. Here as always, it is desirable to substitute a selective birth-rate for a selective death-rate, as a method of progress.

The housing difficulty is so complex that any attempt to "pass a law" which will solve it is likely to fail. Remedies are to be sought rather in (1) city planning and zoning, (2) planned development of residential areas, so that the costs of installing public utilities, which make up the largest part of the cost of housing in many instances, can be kept to a minimum by building up in solid blocks rather than by scattering houses over a tract to enhance the speculative value of the land, and (3) liberal

use of public credit for self-liquidating projects, designed for families with children and giving preference to them.

The trend from the centers of cities to the suburbs, which was manifest in the census of 1930, is probably due largely to parents' trying to find tolerable living conditions for their families. The automobile has helped greatly in this respect. Better rapid transit facilities of all kinds are desirable, and the regulatory power of state and federal commissions should be used to promote zoning of fares that will help disperse the city populations and give them a chance to bring up their children in favorable conditions. If any of the ideal plans envisaged by engineers, for future decentralization of cities and building up of industries in smaller units, ever becomes a fact it will be of great eugenic value. The city populations, it must be remembered, are on the whole a selected group, and the continual draining of talent from the country to the city, and its sterilization in the city, is one of the prime factors of racial decay. Housing is one of the vital points at which this evil can be destroyed.

Various "garden city" projects in America and abroad have helped to set a better standard of suburban life. One of these which was planned definitely as a eugenic experiment is of particular interest to the authors of this book because it was inspired by the reading of a copy of the first edition of *Applied Eugenics* which Alfred Dachert picked up in a Yokohama bookstore while on a trip around the world in 1920. M. Dachert directed a confectionery factory in Strasbourg which, during the World War, made a profit of \$500,000. He and his associates felt that this money, made out of a war in which their compatriots were the victims, was a profit which represented too much national sacrifice to be put to private use, and that it should go rather to the upbuilding of the fatherland. Their attention having been directed to eugenics as above described, they founded a model suburb known as "Les Jardins Ungemach," where families, selected after careful physical and mental tests, could have particularly favorable facilities for bringing

up their children. If the young couples who get these superior facilities at a reasonable price do not have children, they are ejected—a pleasant variant of the American practice of asking a family to vacate its apartment because it is expected to be augmented by a baby.

Of American experiments, the most successful is perhaps that of Radburn, N.J., a commuting suburb of New York City. Here a community has been planned particularly with the interests of children in mind. Through traffic is kept carefully away from streets that children must cross; playgrounds and sandpiles, properly fenced, are so abundantly distributed that any mother can deposit the young ones there and still keep an eye on them from her own window, a nursery is available in which mothers can leave the younger ones for the morning or, if desired, for the whole day, and by intelligent planning the costs of the whole project, with its abundant recreational and educational features, make living there not much more than half what would be paid for the same standard (without the same facilities and conveniences) in a congested urban location.

In France the father of a family is entitled to financial aid from the state, if he wants to build a home of his own. Three children entitle him to *f.*5,000, four to *f.*7,500, five to *f.*10,000, and so on. The rest of the money needed to build can be had as a loan from the state at a low rate of interest (less than 3%). Italy has given similar aid to parents. In Germany the widespread Bund der Kinderreiche or association of people "rich in children" (four living children per couple, or three for a woman who has lost her husband, being held to constitute the minimum wealth that establishes one as being rich in this respect) is particularly active in watching over the housing situation and seeing that its "wealthy" members are not discriminated against by landlords. In the United States, parents have so far tended to suffer in silence. The time has now come when more definite consideration should be given to children, in dealing with the housing problem.

The Ungemach venture is selective, and hence eugenic.

The various proposals in the preceding paragraph are not selective, and hence of doubtful value eugenically. Exemption of \$5,000 assessed valuation, in a home owned by parents who were bringing up minor children in it, would be a more discriminating measure and perhaps workable under the American system of taxation.

## CHAPTER XIX

### ORIGIN AND GROWTH OF THE EUGENICS MOVEMENT

"Eugenics," wrote Francis Galton, who founded the science and coined the name, "is the study of agencies under social control that may improve or impair the racial \* qualities of future generations, either physically or mentally." The definition is universally accepted, but by its use of the word "study" it defines a pure science, and the present book is concerned primarily with the application of such a science. Accepting Galton's definition, we shall for our purposes slightly extend it by saying that applied eugenics embraces all such measures, in use or in prospect, either individually or collectively, as may improve or impair the qualities of future generations of man, either physically or mentally, whether or not this was the avowed purpose. Such measures constitute the application of eugenics, whether or not they were originated for eugenic purposes.

The science of eugenics is the natural result of the spread and acceptance of organic evolution, following the publication of Charles Darwin's work on *The Origin of Species by Means of Natural Selection*, in 1859. It took a generation for his ideas to win the day; but then they revolutionized the intellectual life of the civilized world. Man came to realize that the course of nature in general is regular; that the observed sequences of events can be described in formulas which are called natural laws; that man could achieve great results in plant and animal breeding by working in harmony with these laws. Then the question logically arose, "Is not man himself subject to these same laws? Can he not use his knowledge of them to improve

\* The term "racial" is used by Galton in the sense of hereditary or germinal.

his own species as he has been more or less consciously improving the plants and animals that were of most value to him, for many centuries?"

The evolutionist answered both these questions affirmatively. However great may be the superiority of his mind, man is first of all an animal, subject to the natural laws that govern other animals. He can learn to comply with these laws; he can, therefore, take an active share in furthering the process of evolution toward a higher level.

That, briefly, is the scope of the science of eugenics, as its founder conceived it. "Now that this new animal, man, finds himself somehow in existence, endowed with a little power and intelligence," Galton wrote, "he ought, I submit, to awake to a fuller knowledge of his relatively great position, and begin to assume a deliberate part in furthering the great work of evolution. He may infer the course it is bound to pursue, from his observation of that which it has already followed, and he might devote his modicum of power, intelligence, and kindly feeling to render its future progress less slow and painful. Man has already furthered evolution very considerably, half consciously and for his own personal advantage, but he has not yet risen to the conviction that it is his religious duty to do so, deliberately and systematically."

Such an idea is not wholly new. Some of the thinkers of antiquity gave consideration to the problem. As early as the first half of the sixth century B.C. the Greek poet Theognis of Megara wrote: "We look for rams and asses and stallions of good stock, and one believes that good will come from good; yet a good man minds not to wed an evil daughter of an evil sire, if he but give her much wealth. Wealth confounds our stock. Marvel not that the stock of our folk is tarnished, for the good is mingling with the base." A century later eugenics was discussed by Plato, who suggested that the state intervene to mate the best with the best, and the worst with the worst; the former should be encouraged to have large families, and their children should be reared by the government, while the

Karl Pearson, already in charge of the research work, was invited to hold it. His corps of workers constitutes the Galton Eugenics Laboratory staff.

To spread throughout the British Commonwealth such knowledge of eugenics as might be gathered by specialists, the Eugenics Education Society was formed in 1908 with Galton as honorary president. Its field comprises: (1) Biology in so far as it concerns hereditary selection; (2) Anthropology as related to race and marriage; (3) Politics, where it bears on parenthood in relation to civic worth; (4) Ethics, in so far as it promotes ideals that lead to the improvement of social quality; (5) Religion, in so far as it strengthens and sanctifies eugenic duty.

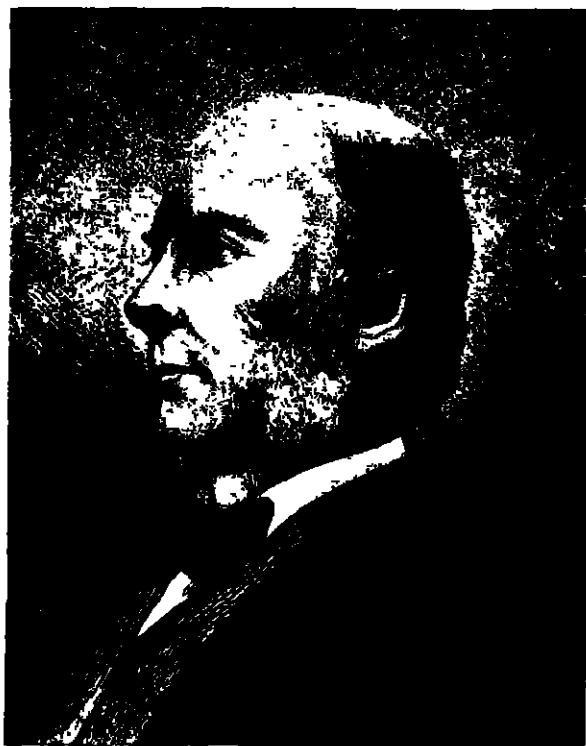
For a score of years under the active leadership of Major Leonard Darwin, a son of Charles Darwin, the organization has always set a high scientific standard. Its name was later shortened to The Eugenic Society, and its objects are now stated as follows:

1. Persistently to set forth the national importance of eugenics in order to modify public opinion, and create a sense of responsibility in the respect of bringing all matters pertaining to parenthood under the domination of eugenic ideals.
2. To spread a knowledge of the laws of heredity so far as they are surely known, and so far as that knowledge may affect the improvement of the race.
3. To further eugenic teaching, at home, in the schools, and elsewhere.

In America the movement got an early start but developed slowly. The first definite step was the formation of an Institute of Heredity in Boston, shortly after 1880, by Loring Moody, who was assisted by the poet Longfellow, Samuel E. Sewall, Mrs. Horace Mann, and other well-known people. He proposed to work very much along the lines that the Eugenics Record Office later adopted, but he was ahead of his time, and his attempt seems to have come to nothing.

In 1883 Alexander Graham Bell, who may be considered the





FRANCIS GALTON

FIG. 40.—Born in the same year as Gregor Mendel, Sir Francis Galton (1822–1911) never knew of the analytical breeding of his contemporary, but proceeded along quite different lines in the study of heredity, applying statistical methods to large groups of material. The technique thus adopted has proved of great value particularly in the study of human heredity; while by his insistence on the importance of good parenthood for human beings, Galton is the founder of eugenics as a branch of modern science.

first scientific worker in eugenics in the United States, published a paper on the danger of the formation of a deaf variety of the human race, in which he gave the result of researches he had made at Martha's Vineyard and other localities during preceding years, on the pedigrees of congenitally deaf persons—deaf mutes, as they were then called. He showed clearly that congenital deafness is largely due to heredity, that it is much increased by consanguineous marriages, and that it is of great importance to prevent the marriage of persons, in both of whose families congenital deafness is present. Four years later he founded the Volta Bureau in Washington, D C, for the study of deafness, and this has fostered research work on this particular phase of heredity.

In 1903 the American Breeders' Association was founded at St. Louis by plant and animal breeders who desired to keep in touch with the new subject of genetics, the science of breeding, which was rapidly coming to have great practical importance. From the outset, the members realized that the changes which they could produce in the races of animals and plants might also be produced in man by other methods, and the science of eugenics was thus recognized on a sound biological basis. Soon a eugenics section was formed, and as the interest in this phase of the work increased, and it was realized that the name of Breeders' Association was too narrowly construed by the public, the association changed its name (1913) to the American Genetic Association, and the name of its organ from the *American Breeders' Magazine* to the *Journal of Heredity*.

Under the auspices of this association, the Eugenics Record Office was established at Cold Spring Harbor, Long Island, N.Y., in 1912, with Dr. Charles B. Davenport as director and Dr. Harry H. Laughlin as superintendent. This was supported for some years by Mrs. Edward H. Harriman, and then taken over (with an endowment from Mrs. Harriman) as a part of the Carnegie Institution of Washington, whose Department of Experimental Evolution is located near-by.

The Eugenics Record Office has been primarily concerned

with gathering pedigrees and other fundamental material for research from every part of the world but particularly from the United States. For some years it maintained an active summer school for workers in eugenics. Partly as an alumni association to keep these summer students in touch with each other, the Eugenics Research Association was founded in 1913. It has become an active organization for the promotion of research in its field and the publication of results through a long series of bulletins and through its monthly *Eugenical News*.

In order that the United States might have a nation-wide educational organization in the field of eugenics, a group of interested persons formed in 1921 the Eugenics Committee of the United States of America, the purpose of which was to lay broad plans for a permanent organization. This resulted in the formation in 1926 of the American Eugenics Society, which published for several years a monthly magazine entitled *Eugenics*, and has taken an active part in the promotion of education, legislation, and other lines of progress.

In 1931 it published the following as its "major proposals."

1. Promote the inclusion of eugenics as an integral part of various appropriate courses through the school system, in the elementary grades and high schools as well as the encouragement of special courses in eugenics in colleges and universities.

- 2 Dissemination of popular education concerning established facts of eugenics by means of. (1) the general press, (2) lecturers, (3) exhibits, (4) pamphlets, books, etc.

- 3 In relation to parenthood:

- (a) Encouragement of research into the relative desirability of various specific hereditary traits in modern life.

- (b) Encouragement of parenthood among those endowed richly with hereditary traits of demonstrated desirability

- (c) Investigation of causes which prevent larger families among those thus richly endowed

4. Encouragement of the recording of definite traits of body and mind in family genealogies. This is not assuming that all traits which "run in families" are purely hereditary, but

such data would be useful in attempting to ascertain the relative importance of heredity.

5. Prevention of the procreation of persons socially inadequate because of defective inheritance, by encouraging the passage of scientifically sound laws for the eugenical sterilization—on a selective basis—of certain potential parents carrying degenerate hereditary qualities. This refers chiefly to the hereditarily feeble-minded, insane, and epileptic.

6. Segregation of certain potential parents who are socially inadequate because of defective inheritance, in cases where custodial care, treatment, or training is advisable.

7. Immigration regulation according to the recommendations of the Committee on Selective Immigration, including the quota system, National Origins, increase of immigration service appropriations, and further selective provisions for intending emigrants based on knowledge of their heredity.

8. Foster eugenic content in laws relating to marriage:

- (a) Minimum age for marriage—at least 16 years.
- (b) Deferment of issuance of marriage license for at least three days from application, and official publication of intent to marry.
- (c) Adequate certification of freedom from serious hereditary defects (hereditary feeble-mindedness, insanity, epilepsy, etc.), and from infectious venereal diseases, as prerequisite to issuance of marriage license.
- (d) Persons of more distant kinship than first cousins, or of those related by marriage but not by heredity, should not be denied marriage license.
- (e) Grounds for divorce should be widened to include besides adultery, the following: hereditary insanity and feeble-mindedness, desertion, and sterility (except when the result of old age).

9. The diffusion of contraceptive information by authorized physicians particularly through public clinics, so that the masses may be provided with the means of conscious control now exercised by the more favored classes

The Race Betterment Foundation, established in 1913 by Dr. John Harvey Kellogg of Battle Creek, Michigan, has sponsored three conferences, at which both eugenics and eugenics were considered. The Human Betterment Foundation, incorporated in 1929, took over work which had been previously carried on for many years by its founder, E. S. Gosney of Pasadena. Its first major project was a study of the workings of California's eugenic sterilization law and a publication of the results. Branch or local societies in several states have promoted educational work and dealt with the interests of their own communities. The Brush Foundation (1928) of Cleveland, Ohio, the Galton Society of New York (1918), the Scripps Foundation for Population Research (1922) at Miami University, Oxford, Ohio, and the National Committee on Maternal Health (1923), with headquarters in New York City, have all promoted research in the field of eugenics. The amount of research, and the number of courses of instruction dealing with eugenics, in American colleges and universities, have increased steadily from year to year, while many organizations in allied fields, such as social hygiene, mental hygiene, birth control, have helped with the task of public education.

The German eugenics society (*Deutsche Gesellschaft für Rassenhygiene*) is the oldest of the world's eugenic societies, though founded (1905) two years later than the American Breeders' Association. A number of other organizations, and several active journals, have placed Germany in a strong position in the development of eugenics. This has been particularly noteworthy since the close of the World War. The German society adopted in 1914 a platform which was revised in 1922. It may be interesting to compare this platform, as a brief statement of the principles and aims of German eugenics, with the recommended program set forth in this book. The revised German document is as follows:

1. The chief danger to which every people is exposed is deterioration through the decrease of vigorous and useful racial elements.

2. A people can survive in the struggle for existence, only if it comprises a large proportion of physically and mentally well-endowed men and women, of good character and morals.

3. The health, vitality, and cultural productivity of a population are not dependent on conditions of the environment (nourishment, education, infectious diseases, etc.) alone, but fundamentally also on inherited tendencies.

4. The heritable constitution of a people is not unchangeable. It can be turned in undesirable directions by two different methods: (a) through dysgenic selection, which leaves the more capable members of the population behind the less capable in respect of reproduction; (b) through direct injury to the germ-plasm, by "racial poisons"

5. At present among civilized peoples a dysgenic selection actually exists to a very large extent.

6. Social ascent unfortunately brings with it, under present-day conditions, real danger of the dying-out of families

7. The inadequate reproduction of these members of society who by hereditary endowment are best qualified for leadership is of the most ominous import to the future of the race.

8. The most important problem of race-hygiene is therefore the preservation of socially valuable families in all classes of the community.

9. Inadequate reproduction is at present more frequently a result of deliberate birth prevention than of unwilling causes (venereal diseases, etc.).

10. Since not all children born attain the age of reproduction, the two-child system leads in a few generations to the disappearance of families. On the average, three children are scarcely sufficient to maintain the family.

11. The motives for birth prevention are principally of a social and economic nature, and race-hygiene must therefore in the first place strive for social and economic reform calculated to destroy, or at least diminish, the prejudice, among sound and capable married couples, against a sufficient number of children.

12. In tax legislation, adequate attention must be paid to the size of family. At the very least, each income and each estate must be divided for purposes of taxation into as many equal parts as there are members of a family.

13. From inheritance taxes, families of three or more children should be entirely exempt, except in the case of excessively large estates.

14. A eugenic basis for inheritance taxation of rural real estate is particularly important. Otherwise it is to be feared that even the present landed families will no longer be able to have a sufficient number of children.

15. In the formation of farm colonies, care must also be taken that the settlers are allowed to have, or to expect, an adequate progeny.

16. The encouragement of rural and suburban settlements is also of importance to race-hygiene.

17. A population policy directed toward a lower birth-rate, in accordance with Neo-Malthusian ideas, endangers eugenics, because it has been found that the decrease in births takes place especially among the most valuable families.

18. A purely quantitative population policy, on the other hand, which attempts to increase the number of births without taking account of the differences of inherited capacity, also tends toward decreased racial fitness, because all such measures lead especially to an increase in the birth-rate of the eugenically inferior.

In spite of French leadership in many fields of science, eugenics has never made progress in France, and the Société Française d'Eugénique, while led by able men, has remained small. There are several aspects of French civilization which account for this situation. In the first place, the tone of French biology is still colored by a Lamarckian view of evolution, to an extent not known elsewhere, and this leads to a false perspective in which the importance of the selective birth-rate is not adequately recognized. In the second place, no country attaches such importance to the complete freedom of the individ-

ual as does France, and this disposes it to look with suspicion on measures which infringe the individual's liberty, even when these measures apply to such extreme cases as the mentally diseased or mentally defective. In the third place, the low birth-rate in France for many decades has been felt as a national peril, in the presence of powerful neighbors, and attention has therefore been centered on the increase of the quantity of population without much regard to quality—a policy obviously quite the reverse of eugenic.

The extensive measures taken in France to increase the birth-rate are therefore population measures, rather than eugenic measures. Some of these measures (1) aid those in need of charity; (2) others provide family allowances, beginning with the law of July 14, 1913, which authorized a supplemental income for heads of families with sons under 13 years of age, the supplement to begin with the fourth son and the amount varying from 270 to 300 francs per year per son. (3) Further measures compensate the family for its double financial burden of taxation and consumption, while (4) a long series of measures favors large families in such ways as follows:

- (a) Housing.
- (b) Social insurance.
- (c) Reduction of military duty.
- (d) Education.
- (e) Transportation.

(f) Maternity benefits, which under the law of July 22, 1923, provide that each family of French nationality resident in France having more than three living sons under 13 years of age may receive from the state a subsidy of f.360 for each one born beyond the third.

(g) Prizes, particularly the "Medal of the French Family" (bronze to mothers of 5, silver to mothers of 8, gold to mothers of 10 children). Holders of the medal, numbering nearly half a million women, form the Association of French Mothers.

(h) Special assistance to government officials with large families.



(i) The "family wage" to recompense fathers of large families in industry. As early as 1900 some industries introduced the plan of paying employees in proportion to the size of their families, and this plan spread widely after the war. There are several hundred industrial compensation funds or equalization pools, to which all the members of an industry contribute in proportion to the number of employees. The funds are then paid out of this pool to the individual worker. This feature insures that no firm will find it profitable to discriminate against workers with large families; for if it does so it will simply have to pay the savings as its share of the salary of some other firm's workers. There are now several million workers under this system, and several hundred million francs yearly are paid out to them according to various sliding scales.

(j) Private initiative has led to the establishment of several hundred prizes awarded each year by the Académie Française to large and deserving families, the total amount reaching several million francs a year.

(k) An active educational propaganda has been carried on. Numerous Congresses of Natality have been held; Family Associations number more than two million members and maintain a Family Press Agency to see that the daily journals get adequate information about the interests of the family. One of the aspirations of these associations is to make the ballot depend on family status, since of eleven million voters, seven million—a notable majority—are either bachelors or fathers of not more than a child or two, in short, men of slight responsibility in the eyes of the Family Associations. The other four million voters are fathers of three or more children each and although in a permanent electoral minority, they represent 25 million out of the 40 million inhabitants of France. It is proposed, therefore, to let men cast votes in proportion to the size of their families, so that the population may be more fairly represented on election day.

Such measures and others, it will be noted, are quantitative measures. Their aim is to produce more citizens and. presum-

ably, more soldiers. It is evident that many of these measures, if effective at all, are likely to produce quantity at the expense of quality. As a fact, they have not sufficed to raise the birth-rate except in isolated cases. On the other hand, it is possible that without them, the birth-rate might have fallen still further, so one can not say that they have had no result.

Italy has several small but active eugenic organizations. However, the state is definitely oriented toward a population policy that will provide increase without much regard to quality. This has been carried out enthusiastically, under the combined drive of the Fascist government and the Roman Catholic Church. Among the measures used are.

- (a) Reduction of the legal age of marriage to 16 for males and 14 for females.
- (b) Restriction of emigration.
- (c) Encouragement of rural colonization and restriction of immigration to the cities.
- (d) Housing reforms.
- (e) Tax exemption for large families, legitimate or illegitimate.
- (f) Disabilities placed on bachelors and spinsters, not merely through extra taxation, but through discrimination in employment.
- (g) Similar discrimination against the unmarried and against childless couples, in the allotment of workmen's houses.
- (h) Family allowances, the scale of pay being doubled in some cases when there are more than three children.
- (i) An extensive program of prenatal and postnatal care, for the reduction of infant and maternal mortality. Hospitals are required to give, when necessary, free lying-in care of mothers.
- (j) Vigorous efforts to prevent dissemination of contraceptive information, and a war on abortion, the penalty even including deportation.
- (k) Italian women living in France are subsidized if they return to give birth to their children on Italian soil

(1) A continuous educational propaganda is carried on. Direct subsidies to large families are held by the promoters of this "demographic propulsive policy" to be less effective, since by raising the standard of living they may merely encourage birth limitation. The keynote of the Italian policy is to encourage the rapid breeders, since these alone have the adequate "reproductive vitality" to affect the birth-rate favorably. In spite of the energy which has been put into this population policy, the birth-rate of Italy has shown a tendency to drop like that of other European countries, and although it is still higher than most, this is at least partly due to such measures as the restriction of emigration, rather than to direct efforts to stimulate the birth-rate. Here, as in France, the eugenicist can not help feeling that if the measures employed are successful, it will be in the production only of quantity of population more frequently at the expense of quality.

Most other European countries now have eugenics organizations, many of them active and ably led. While the programs differ a little from one country to another, in accordance with local needs, the ideals are largely the same. As a sample, the Norwegian program may be given.

*Negative race-hygiene.* (Reduction of the number of inferior racial elements.)

(a) Segregation (negative colonization system) voluntary for imbeciles, epileptics, and similar mentally or physically defective individuals, compulsory for drunkards, habitual criminals, professional beggars, and all who refuse to work. We should not treat the crime but the criminal

(b) Sterilization. No compulsory sterilization. Voluntary for certain types, who wish to avoid segregation

*Positive race-hygiene.* (Increase of the number of valuable racial elements.)

(c) Biological enlightenment Race-biology in school and university and distribution of information literature. State laboratory for race-biology and genealogy. The education of

women should not be masculine, but should specially include biology (renewal of the family).

(d) A taxation, wage, and colonization system favorable to the family. Maternity insurance and other protective pre-natal measures for bread-winners. (Positive colonization system.)

*Prophylactic race-hygiene.* (Prenatal protection of the individual.)

(e) Combating racial poisons (especially syphilis), narcotic poisons (especially alcohol); and (1) Prevention of racial national diseases as a function of the state. (2) Health declaration before marriage. (3) Classification system of and progressive taxation for alcoholic liquors.

(f) Crossings between distant races should—until we have acquired more knowledge—not be advised. In preparing rules and laws respecting immigration this point should have the greatest weight.

(g) Biological registration of the whole nation. (Biogram.)

Eugenics societies in other parts of the world—as for instance Latin America, South Africa, Japan, India, and the Dutch East Indies—have adopted policies which in their general outlines correspond with those of the Europeans. All these countries coöperate in the International Federation of Eugenics Organizations, made up of delegates from the various societies. Three international congresses of eugenics have been held, the first in London, 1912, the second in New York, 1921, and the third in New York, 1932.

Russia has not taken an active part in the international eugenics movement, but deserves consideration on its own account.

For reasons made clear in the section dealing with socialism (Chapter XVII), there is genuine opposition to positive eugenics on the part of the Communist Party. This opposition is in part due to the emotional reaction against the excessive claims of racial and class differences current in non-socialist societies and especially in pre-war Russia and Germany. That the Soviet has not directly suppressed the Russian Eu-

genic Society, which recently was still alive, though apparently moribund, is probably due to the heavy state expense of the care of hereditary defectives. For the present, the Party entertains exaggerated hopes of normalizing the insane and other defectives, centering on endocrine operations and injections at an institution in Maxim Gorki (formerly Nizhni Novgorod). The disappointment from the comparative failure of this method has already led to an active interest in sterilization. When the Soviet government does begin to sterilize in earnest (it is keenly sensitive to all economic advantages), the sterilization program is likely to be on a large scale.

The extensive research for more satisfactory methods of contraception at Leningrad, the Party does not consider as eugenic. But, in view of a birth-rate ratio of country to city of more than two to one, which is due primarily to the unbalanced application of contraception, this is in reality research in eugenics.

The Russian Eugenic Society which published a journal for several years apparently found it desirable to deflect its work largely to genetics. An active movement for effectively promoting the usual eugenic program would not now be possible in Russia. In fact the work of the Soviet eugenists has shown a drift toward pure genetics and animal and plant breeding, all of which is well supported. Since appropriations are more easily had for studies in either pure genetics or studies of economic plants and animals, as elsewhere, and as the "red biology," with its partisan equalitarianism and Neo-Lamarckism, receives the Party's smiles, eugenic activities will probably make but little progress for a while. As publishing is so rigorously centralized and controlled in the U.S.S.R., the books published show a strong bias in the genetic direction and classroom teaching follows accordingly. It would be indeed courageous for a Soviet biology teacher to give a genuinely frank course in eugenics. The Soviet attitude is further shown in the fact that they do not invite visiting eugenists to speak, not even to scientific groups.

Experience in the United States has shown that in the early history of eugenics one of the most potent influences was that of the plant and animal breeders and those familiar with their work. Indeed, it was the strong interest in eugenics which was the principal factor in changing the name American Breeders' Association to the American Genetic Association.

Thus, in the Soviet Union, where over 80% live from the soil and with whom agricultural education is encouraged, especially in plant and animal breeding, we prophesy that the peasant only requires a more potent rôle in the government to produce eventually an active eugenic influence. The former peasant gradually is winning education, roads, communications, and experience. The growing power of the Russian *kolkhoznik* (member of a collective) and of the *sovkhosnik* (one hired by a state farm) seems sure to bring them greater influence in the determination of national policy. This is one reason why there is hope for a negative eugenics movement in the Soviet Union, in spite of its relative eclipse at present.

Another cause for a later revival of eugenics lies in the heavy economic burden of caring for the members of society who are parasitic, not from will but from incompetence. The Russian communist was eager to throw off all exploiters from his back. He is still carrying a large number and does not yet feel it seriously because he is still dazzled with the confident hope of normalizing these groups.

The situation is, then, that the Russian Eugenic Society is now, and was, when more active, limited largely to negative eugenics. Nevertheless, on the Russian stage some of the most significant events, eugenically, are happening because of the magnitude of the number affected in the far-reaching decrees which are issued by the highly centralized, aggressive, and powerful government.

War, revolution, poverty, and starvation, and the execution or exiling of a large proportion of the intelligentsia of former days, have been strong dysgenic influences in Russia in the

last few decades. Lethal selection has played a larger part there than in most other countries.

Sexual selection is particularly interesting to study, because of the radical revision of laws concerning marriage, divorce, and the family. In the cities and industrial communities, there is a percentage of matings without ceremony, usually referred to as unregistered marriages, which the Party is combating by educational means, but with slow progress. In other countries the struggle for a more eugenic type of marriage has been in the direction of certification, of a required waiting period, and of compulsory publicity of intentions. In the Soviet Union the trend has been exactly the reverse. Marriage may begin at any time, on the most transient impulse, without any particular consideration or consultation. Under these conditions, matings can not be as highly selective.

On the eugenic side, however, is the "aliment" provision. This makes all children entitled, should the mates separate, to what would elsewhere be considered a strikingly large contribution from the father's income, namely, one-third for one child, one-half for two or more children. Paternity therefore tends to be more carefully considered, as distinct from mating. Easy divorce, at the desire of either party, by mere registration of the fact, severs less successful matings. In other countries, easy divorce has been feared as tending to promote thoughtless marriages. Russian eugenists argue that easy divorce removes more difficulties than it creates.

The outstanding eugenic feature in the Soviet Union today, however, is fecundal selection. It presents the following aspects:

(a) In the cities, the demand both for contraceptive materials and for abortion operations is great. As the medical service and supplies steadily become more adequate, and as advances are made in contraceptive technique, the birth-rate will drop. The Commissariat of Public Health of the Soviet Union is more alert to this matter than similar officials in any other country. The Russian city promises to show some of the lowest birth-rates in the world, in spite of the very high na-

tional birth-rate last reported. *The change in birth-rate in the countryside will lag, of course, although a stationary population seems not far distant.*

(b) Nowhere else in the world is the political position of women as strong as it is in the Soviet Union. There are potent women's congresses and they have eagerly forwarded the present policy of contraception and abortion and will insure the spread of the former.

(c) Yet, the Russian Catholic Church in rural districts fights both abortion and contraception, and the individual peasant is still somewhat influenced by the church, in spite of the dwindling prestige of the church in the cities. Church influence is rapidly waning even in the country as farm collectivization proceeds.

(d) The unique land distribution policy, where there are still individual peasant holdings, makes for a large rural family. Even before the Revolution, in many parts of Russia this plan was in effect. At an interval determined in part by the system of crop rotation, generally six or nine years, the land was redistributed in equal value to all the "eaters" in the peasant's village. Since the land available in most villages is not enough to give each peasant and his wife the amount they want or really need, this redistribution is in reality a "baby bounty" of unprecedented magnitude and effectiveness. It is a potent factor in the amazing fecundity of the Russian peasant. Like "baby bounties" elsewhere, it probably works dysgenically. Evidence in other countries makes it appear that rural stock is, on the average, inferior to city stock. This is the more likely in the Soviet Union because the old rural cultural backwardness had accelerated the exodus of intellectuals. The present Russian customs, therefore, putting a premium on fecundity in the country and leading to a very low birth-rate in the city, are extremely harmful to the maintenance of sound racial values.

(e) The shortage of contraceptive services in those parts of the country which are not in the collectives, the uninfluen-



*tial position of peasant women, the more favorable conditions for raising children than in the city, all make for the maintenance at present of the extraordinarily high fecundity of Russian peasant women.*

(f) The farm collective and the government farm are replacing the individual peasant at a very rapid rate. Three notable results claim attention:

i. The severe hardship to which the kulaks and their families are subjected. Formerly, a kulak was defined as a peasant with relatively more property or a peasant employing others. The word is now extended to include those peasants who resist collectivization. *That these kulaks are on the average of higher intelligence is probable from their more successful production.*

ii. The change of the basis of the infant in the collective. The heavy baby bounty comes to an end and children will no longer be such an economic asset. The woman worker in the collective will presently escape from the traditional old-peasant fecundity.

iii. A reduced birth-rate can be retarded if the Party withholds contraception service and materials from the peasant wife. But the worker in the collective is no longer a "peasant," who occupies a position of but little power in the "workers and peasants" government. He has become a "worker" and is in a position to agitate for a larger share of power in the Party and therefore he is one from whom the privileges of the worker are less easily withheld.

(g) The collective farm, at first small and largely self-controlled, is soon merged, in its accounts and management, with others. Other changes are promulgated from above, the certain course of which is to bring the collective slowly closer and closer to the status of a state farm in which each member will be a full-fledged "worker" receiving wages only. This gives the family of farm workers an income dependent on the worker's industry and skill, as is true with the city worker.

Because of the immense number of persons involved, the

radical measures adopted, and the power to enforce these measures, the experiences of Soviet Russia will be watched with the greatest interest during the next generation. So far, it appears that the results have not, on the whole, been favorable to eugenic progress.

The eugenic aspect of the Orient must necessarily interest eugenists, since apparently the Orient will constitute in the future a much larger proportion of the human species than it does today. This increasing rôle of the Orient is being caused by the amazingly rapid decline of the birth-rate among the white races, a decline which has not yet seriously affected the Orientals, and is not likely to spread very rapidly among them. The rapidity of the increase in China is to a large degree dependent, however, on the suppression of civil war and the establishment of a government capable of suppressing inordinate brigandage. In addition, the Orientals can tolerate the tropical regions very much more successfully than can the whites. What are the forces that are moulding these Oriental peoples who in all probability will constitute so large a proportion of the future world population?

In China and India the rigorous selection by death from overcrowding is very well known. In China, however, there is a counteracting factor of much importance, that is, a state of widespread and devastating brigandage. In Northern Manchuria for scores of miles, one can see only farms that are fortified. They tell their own story. These factors, and generations of graft, have produced an unusually objectionable distribution of wealth in a country where wealth, even more than usual, promotes survival. In China the extension of law and order and of honest governmental administration would rival in importance any other eugenic step that at present could be taken. Civil war and especially communistic civil war is especially dysgenic, as the leaders on each side are the victims especially sought.

In the field of sexual selection, China is in general characterized by the arranged marriage, which is generally subject to

"the auspices" as determined by the necromancer. The necromancer is one of the most dysgenic institutions of the East. Something can be said in general for the arranged marriages. But in China it is proper and customary to have marriages arranged by brokers who obviously would not and could not make as careful a selection as the heads of families themselves, for the broker has not enough at stake to cause him to get the best mate possible for his employer's son or daughter. Could the broker and necromancy be dispensed with, the arranged marriage of the East could with less difficulty be compared with the romantic marriage of the West. It might be said that since the desirability of a candidate is largely measured by the acceptability of his or her family, hereditary factors do claim some attention. This is true in so far as the eminence of members of a family is concerned. But regard for eminence is not adequately discriminating in a world without exacting intellectual demands where mental shortcomings show up more effectively. Hereditary factors are not so observable in a people with an education as sparsely distributed as it is among the Chinese.

The outstanding eugenic feature of the Orient is the effect that the very strong family unit there offers in resisting the powerful trend towards a lower birth-rate among the intelligentsia, a trend which is so manifest in the western world. The significant feature is that Chinese men and women feel an impelling ambition to be married and to be the parents of several children. This ambition is in part inculcated by the stress on the impiety of not having male offspring; for it is the male descendants who regularly keep the ancestor's graves in order and perform proper ceremonies twice a year. Failure in these respects renders the departed ancestors less happy and, as many believe, reduces the supernatural aids that the officiating descendants may expect. The Chinese insistence on having male progeny necessarily increases the size of family. Ordinarily parents in producing two or three sons, to insure success, produce two or three daughters as well. However, the standards call for a still larger family. The occasional instances of in-

fanticide of female children, in cases of severe economic pressure, must not be thought to indicate any lack of maternal instinct. This is apparently well developed and a real factor in maintaining the size of the family. The international consequence of fecundal selection, especially as the death-rate is regularly decreasing with the spread of western medical arts, will be a great increase in the Oriental population in marked contrast to a less rapid increase of the western peoples.

The prospect of the eugenic movement in China, involving a definite program and substantial achievement, is relatively poor. The following factors all contribute to this discouraging situation: a feeble, uncentralized government, poor transportation and communication, widespread ignorance, conservatism produced by paternal authority, a national poverty that greatly limits appropriations made for institutions, and medical backwardness that makes sterilization seem to be a more radical procedure than it really is.

The eugenic movement in Japan has its unique advantages and handicaps. There are at present two active societies corresponding very closely to the Eugenics Research Society and the American Eugenics Society in America. The government of Japan and the Japanese newspapers have shown friendly coöperation with these societies. In fact the greatest opportunity of eugenics in Japan is the Japanese practice of initiating important social legislation in commissions in which experts take a leading part.

The marriage system in Japan is in many respects less eugenic than that in practice in the West but in a few respects it is more eugenic. The Japanese eugenicists appreciate this and are giving it attention.

The favorable features are these:

1. The strongly felt importance of marrying into a family with a minimum number of individuals of whom one must feel ashamed. The fact that families strive so hard to conceal such black sheep is significant. It is also true that in Japan mere rank and other relatively superficial features are overweighted.

2. The rarity of any man of consequence being a bachelor and therefore, being childless.

3. The rarity of a woman, whether because of career, vanity, or cowardice, having only one or two children.

The features in which Japanese marriage acts less well, eugenically are these:

1. There is no provision for a marriage license to be issued before the ceremony, nor is there sufficient legal and social pressure to cause the go-between to whom is left the registration, to attend to this formality conscientiously. The result is that marriage is too casual an event and hence that mate selection is not as careful as it should be. It is true that a ceremony before a go-between is quite generally used, but the go-between may be any friend or broker and he has no responsibility to have the marriage registered. Without registration the marriage has no standing in law, not even that of a common-law marriage.

2. Registration of a man or woman up to thirty years of age requires the signature of the go-between and of the four parents. This gives the parents a veto power on the registration, but not on a ceremony. The effect of this is to produce many quasi-marriages, corresponding to the unregistered marriage of the Soviet Union, except that in Japan the children are not legitimate. Public opinion among the younger generation is somewhat tolerant of these alliances because they now entertain a critical attitude towards the excessive power of veto held by the parents. An imperial commission is developing a new marriage law, but their long delay indicates how strong is the resistance that the conservatives are offering to modern attempts to reduce parental power.

The separate education of the sexes in Japan is probably kept up in part as a means of retaining, for the parents and the broker, the initiative in marriage.

Romantic marriage does not work satisfactorily as yet in Japan. By romantic marriage, we mean a marriage that is initiated on the basis of the affection of at least one of the pair.

Slowly and inevitably it is finding its way into Japan at the cost of much personal conflict and individual grievance. Successful operation of a system of romantic marriage depends on co-education and other social machinery that makes the young become mutually acquainted. Japan will be dissatisfied with the results of romantic marriage on the whole until her other institutions become better adapted to it.

One reactionary factor in Japan is a by-product of the arranged marriage. This is the professional woman entertainer. The art of being attractive should not be a specialty but should be taught, to a reasonable degree, to all young people. The geisha girl would be best abolished by taking the best of her arts and making them the common property of all Japanese women. A man should expect to find in his sweetheart and his wife all the attraction he could find anywhere. The geisha will thrive in Japan as long as other women have their freedom and individuality curtailed. With freedom and initiative more general, the geisha will cease to be an important social problem. As a consequence charm in Japanese women will be greater, in total amount, than ever.

The great restriction on a Japanese woman's activity and the exaggerated degree to which intellectual groups meet without women, as at scientific meetings, is deplorable. It probably will soon pass.

When a higher level of economic well-being is attained in Japan by an adjusted fecundity, and the dominant military spirit, with the heavy expenses it entails, is brought within bounds, the eugenic movement will go forward rapidly. The stage is set for such progress, with a strong, centralized, active, and ambitious government, with a people keenly race-conscious, highly unified, and ultra-patriotic. The fact that this proud race has suffered taunts which it regards as implying race-inferiority, and rightfully repudiates, makes it more receptive to a eugenic movement. It can not alter the quality of its people by a policy of selective immigration, for it is not an immigrant-receiving country. It can, however, provide ade-

quate facilities for segregation of some of the unfit, and it can sterilize others. It starts with the great advantage that its superior people show a high marriage rate and birth-rate. In this respect its main objective should be to avoid the evil influence of the West. There is no serious obstacle from equalitarian ideals or from religious doctrines. It seems probable that Japan within the next generation or two will be one of the world's leaders in the promotion of a eugenic population policy.

## CHAPTER XX

### THE DIRECTION OF HUMAN EVOLUTION

Man has reached his present stage in the course of evolution after a very long, slow climb from a very simple and humble origin. By whatever general process evolution may have taken place, it has proceeded along certain general lines. These lines are not direct. Indeed, straight lines of progress are curiously rare in evolution, which continually amazes the student by the devious ways in which it operates. A general direction can be observed, but it is often deflected, and innumerable species have fallen out of line and disappeared.

The peculiarly indirect ways in which adaptive results appear in evolution may be illustrated by the bones of man's inner ear. They are arranged to form a good sound transmitting apparatus. The philosopher of a century ago would unhesitatingly have pointed them out as a beautiful instance of the nicety with which nature, or God, worked to provide useful organs.

But what is the actual origin of this auditory apparatus? A study of man's ancestors shows that *it was made up of some leftovers originally intended for a wholly different purpose.* The reptile has a jaw with several articulations, instead of the single hinge which does duty in man. Hence, a reptile can open his mouth much wider, in proportion, than a man can, and a snake can, through these extra joints in the jaw, swallow an animal larger than he is, while few men have a stretch of jaw large enough to be able to get a billiard ball into the mouth.

In the course of evolution the bones of this reptilian jaw were displaced. A new plan was being followed (to speak at least figuratively) in which the jaw was to have only a single hinge. These extra jaw bones were no longer needed, but nature, being as economical in some things as wasteful in others, would



not or could not throw them away. By a slow evolutionary process they were moved up into the head and rearranged as the bones of the middle ear. Man's hearing apparatus, therefore, represents nothing more than a lizard's lower jaw that has been "factory rebuilt."

But if the lines along which evolution has proceeded are often devious, the general trend can yet be seen, or rather half a dozen general trends.<sup>79</sup> A study of these trends is as important to the eugenicist as it is interesting to the evolutionist.

1. There has been a general tendency toward increase in size, in the course of organic evolution. Large body size early in life is an advantage to the individual in competition with other individuals, especially in a species where more than one young is produced at a birth. Large size may also be advantageous to a child in getting him quickly out of the dangerous period of infancy. There is, therefore, a selection in favor of individuals who have a rapid rate of growth while young, but when this rate extends on into adult life it produces corresponding changes which may be favorable in moderation, but unfavorable in extreme. In man the increase of body size at birth is sharply limited by the size of woman's pelvis. Since *increased brain capacity is an important factor in evolution*, and since brain capacity is associated at least to a slight extent with increased size of brain, which requires increased size of skull, there has been a tendency in the course of evolution for man's brain to become larger, and for woman's pelvis at the same time to become broader. Civilized races are in general marked both by larger skulls and by wider pelvises than those of *savage races*.

In the days before obstetrical surgery, the child with an unusually large skull would probably die unborn, but the woman with an unusually narrow pelvis would probably die also, at the birth of her first child. Natural selection, therefore, brought about an adequate width of pelvis. Since the advent of surgical delivery, the woman with a narrow pelvis no longer necessarily dies, but is quite likely to survive and hand on to her daughters,

in turn, her narrow hips. If such a trend continued long enough it would tend to put a limitation on the development of the human skull. It seems probable, therefore, that actual increase of brain capacity will not be the main feature of intellectual development in the future, but rather that an increase in the complexity of the brain will occur. Cartoonists who picture the superman of the future as a misshapen creature with greatly overgrown head are probably quite wrong. In short, any marked increase in size of man, or in his general proportions, will probably not be a part of his future evolution in any future that can be foreseen.

2. Complexity, differentiation, and division of labor This is true of the body of an individual and, in some ways, of an aggregation of individuals. In some lines of evolution, everything is organized on the basis of instinct, as with the social Hymenoptera (bees, wasps, and ants). Among these reproduction is limited to a very few members of the species, the bulk are merely workers and virtually sexless. Mammals have proceeded along a wholly different line, in which feelings, will, and reason to a large degree take the place of instincts. Presumably this trend will continue in the future; at any rate, it is quite impossible that mammals should now go back and branch off on the line followed by the bees and ants. Specialization in the future will, therefore, probably be farther and farther away from the bee-hive and ant-heap, and in a direction to gratify the abundant human desires and impulses.

However, from an evolutionary point of view, the trend toward specialization must not go so far as to encounter natural selection that will tend toward extermination. With the limited fecundity of the human female (itself an adaptation for greater individual development), as well as the universal need for satisfaction of all the desires of the species (instead of having these segregated in a few individuals as among the Hymenoptera), it becomes necessary that all members of the species who are not defective should take an active part in the production of offspring. This does not permit the existence of

large class of non-reproducing females, particularly if they be highly intellectual. On the one hand, the intellectual women can not be sterilized and set to taking care of other women's babies for genetic reasons. On the other hand, the defective males can not be given this job of child-care for eutheic reasons. Hence, the trend of evolution is likely to make it necessary that every normal woman do her share in bearing and rearing children, no matter what further division of labor may make the menial tasks incident to this occupation lighter. The dream of some feminists, who envisage a future state in which intellectual women will do only intellectual work and the task of perpetuating the species will be left to the non-intellectual women, is clearly incompatible with the survival of the group.

Again, the increasing differentiation that accompanies evolution will probably bring about an increasing differentiation between the two sexes, since such differentiation seems to be favorable to sexual selection as well as to the greatest individual happiness.

Finally, the man who wants merely to procreate and then to disappear from the scene is biologically a throwback to a stage of evolution that was passed by, hundreds of millions of years ago. Hence, the unmarried mother is not in the line of evolutionary progress.

3. Integration, or an increase in the harmony of parts and therefore of the unity of the whole, is another conspicuous trend in organic evolution. The most important aspect of this is doubtless to be seen in the development of the central nervous system. If man's brain is not likely to increase greatly in size in the future, it can still increase in efficiency. Neurologists have expressed the opinion that the average human brain can become at least twice as efficient as now, by a process of evolution in which the defective strains will be eliminated from the species.

4 Increase in self-regulation, increase in independence of the environment, has been an outstanding feature of the course

of evolution. From the jelly-fish, floating with the current and taking its temperature from the surrounding water, to the mammal, going where he likes and maintaining his body heat at about the same degree, whether the weather be freezing or burning, there has been a steady gain in this capacity for self-regulation. Of course this trend can not proceed beyond the limitations of the material, hence, there is no immediate prospect of extending the span of life (see Chapter VI). Such an increase in longevity could result only from a slow process of breeding.

From a social point of view, the period of delay between puberty and marriage, which increases as a people rises in the scale of civilization, is self-regulatory adaptation. Among the most primitive peoples, it is probable that mating occurred shortly after physiological puberty, as is the case with most other animals. While there is a great variation in this respect among the tribes of the present and past whose customs are known, there has been a gradual increase in the period that elapsed between puberty and marriage. This has allowed the higher development of the intelligence, without giving the primitive and powerful impulses toward reproduction a chance to take the dominance in the individual's life too soon. This has resulted in the integration of the personality at a higher level, and probably has made possible a better sexual selection.

It is, therefore, a serious error to point to this gap between puberty and marriage as a source of much of the disharmony and disorganization of society, as has been done by some popular writers lately. Proposals to encourage, by legal approval, the formation of experimental sexual unions or so-called companionates among adolescents envisage a long step backward from an evolutionary point of view. This, of course, should not be interpreted to mean that somewhat earlier marriage is not desirable for many educated people. Ideally, marriage should take place after physical development is virtually completed, but before intellectual development has wholly ceased. If it is delayed until after the latter development has stopped

the individual is less adjustable, is likely to be in a mental rut, and may be less successful in marriage and parenthood.

Evidently the control of conception, or voluntary parenthood, is also to be classified under this heading as an inevitable aspect of the progressive evolution of mankind.

5. As a species rises in the evolutionary scale, it is better and better able to bring past experience to bear on present problems. As against the clumsy "trial and error" of the amoeba, the bird builds his nest the first time as well as he ever does in the future, even though he has never seen a nest built. Instinct has appeared to guide him. With mankind, the greatest step forward has been the development of tradition, in which a great epoch was marked by the beginning of speech. Perhaps a still greater advance has been the development of written language.

This should mean that with progress there is a less likelihood of failure and extermination than would result from the mere chance that largely governs the amoeba's twists and turnings. While human history is marked by the wreck of peoples that have taken the wrong direction in such important matters as family organization, just as the history of evolution is marked by the disappearance of species that have gone off on a fatal line of development, or failed to make the necessary adaptation to changing conditions, this sort of catastrophe should be rarer with continued biological and intellectual progress. Man today should be able to substitute experience for guesswork, to profit by the mistakes of others and not have to repeat them all over again himself. From this point of view there is no merit in the contention by W. M. Flinders Petrie, Oswald Spengler, and others, that civilizations necessarily grow old and decay. The individual grows old and dies because of the interdependence of his parts and his inability to substitute new parts for those that are worn out. Society, however, has a greater capacity for self-regulation than has the individual, because it can eliminate defective parts without committing suicide. The prerequisite to a wise social control of human

evolution is, therefore, the study of evolution in the past—yet in some states such study has been forbidden by law!

6. Development of psychical capacities,—of willing, feeling, and reason,—has been an important factor in progressive evolution. The monogamous family has been a valuable adaptation to this end, by giving every child two experienced adults who were particularly interested in his development and who in turn would gain from him satisfactions of their own, much greater and richer and more complex than those the worker bee can be supposed to feel when she passes honey into the cells of the whole brood. There was thus a tendency for the more intelligent families, which gave the best care to their children, to survive.

The more one studies the monogamous family, the more one is convinced of its importance as a factor in the progressive evolution of mankind. Its chief biological bases are the following:

- (a) The fundamental mating impulse.
- (b) An extension of this as comradeship (a specialization of the herd impulse).
- (c) An instinct to give the children parental care (tenderness, protection).
- (d) Jealousy of others who might be rivals for a mate.
- (e) Helplessness of the child at birth.
- (f) Long period of growth of child, during which it is dependent (an extremely important factor).
- (g) The marked handicapping of the female while the child is still small, making it desirable for her to have the protective care of a mate for a prolonged period.
- (h) Lack of any seasonal period of mating in man.
- (i) Overlapping of the periods of immaturity of successive children.
- (j) Complexity of the individual life-career, and the intertwining of its manifold activities with these reproductive relations.

Given these facts one can not see how any other type of

mating except monogamy could have become the eventual standard. The future evolution of mankind will probably combine greater intelligence with a stronger family life. Tendencies to make child-rearing a communal occupation are reminiscent of the social Hymenoptera, and the swing away from such tendencies may be large, though undoubtedly continued division of labor will separate the bearing and rearing of children from still more of the recent economic and industrial accretions that only interfere with normal biological functioning.

Along the half-dozen lines that have been mentioned, organic evolution seems to have taken place. Man, like all other species, has followed these general trends, under the influence of the four great factors of evolution: mutation, selection, isolation, and inbreeding <sup>173</sup>

The task of the eugenicist is to devise ways in which these four factors may be made to promote evolution toward the goal of a society in which each individual will lead a fuller, richer, happier, and more productive life. Every custom and every institution must be scrutinized as to how it is related to the action of the factors of evolution. The pages of this book have been given over to such a scrutiny. Here a final summary may be found convenient.

(a) Mutation as a factor in evolution may be left aside. As pointed out in Chapter II, it is not an important factor in any case, but even if it were, it is scarcely subject to control.

(b) Selection is constantly at work in human society. Lethal selection is in some ways less important than it was a million years ago, in other ways more important. Reproductive selection is immensely more important, and is acting at a much more rapid rate in man than in most other species. The future of any society depends largely on the extent to which it can shape its customs and institutions so as to favor selection along the lines of progressive evolution, instead of lines leading to extinction as has so often been the case in history.

(c) If one takes a long view over the past, isolation seems to be more important than any other single factor in evolutionary

differentiation, because it tends to concentrate the lines of descent and thereby to produce differences of gene-balance. While it has been a conspicuous factor in human evolution, even in contemporary times, it will probably be less and less active as freer movements of population take place. On the other hand, geographical barriers are by no means the only ones, or the most important ones, that create isolation in this sense. Racial, linguistic, religious, social, or economic barriers have been highly effective, and it is by no means impossible that future evolution will see some of these barriers persisting longer than is generally expected. Many naïve views are expressed about the likelihood that all mankind will eventually become homogeneous. This is not the ordinary course of events in any species with a wide range, and there is no evidence that it is occurring in man. In fact, the opposite tendency seems to be found in many directions, as manifested for instance by more definite stratification of society along social and economic lines, in a long-settled community.<sup>140</sup> It is not at all impossible that social and psychological barriers will function more effectively in the future than they do now, as equalitarian ideas are gradually dropped.

The development of equalitarian ideas, which constitute one of the most formidable obstacles to evolutionary progress at the present time, deserves a more detailed discussion than is possible in this chapter. The most primitive man, if judged by people of simple cultures at the present day, was substantially free from equalitarianism. Among such people individuals usually must show some evidence of prowess before receiving social privileges (often including the right to marry). Government is almost always oligarchic or monarchic. Even with hereditary chieftainship, the dynasty is likely to change, as a new strong man appears from time to time and seizes power. Slavery is widely practiced, and the foreigner is usually considered inferior. The very names of a surprisingly large proportion of savage tribes have such significance as "the men" or "the people," evidencing their feeling that the rest of the world



was in a lower category. In such late periods as marked the so-called democracies of Greece, Rome, and Venice, government was in fact oligarchic, equalitarianism being the prerogative only of a small class or caste.

The principle of equalitarianism made little headway until incubated by the excessive tyranny of the privileged classes in feudal France. The reaction against this, which is identified with the name of J. J. Rousseau, reached the United States especially through the influence of Thomas Jefferson. It was a factor in the promotion of the American Revolution and in the promulgation of the Declaration of Independence. When it came to the drafting of the Constitution, practical considerations and economic interests prevented any thoroughgoing application of equalitarian ideas, but since that time the doctrine has received impetus in the long struggle to abolish Negro slavery, while the Chinese Revolution and the Russian Revolution, in the present century, both tended to give it spread.

Parallel to this equalitarian course in political and social ideas there is a corresponding development in religion. A third field, astonishingly enough, has been in modern biology and psychology, but with the progress of research and the development of more satisfactory tests of individual differences of all kinds, the swing away from it will doubtless be rapid. The temporary vogue of the "Behaviorist" cult in psychology a few years ago was a strange jump back to the ideas of the eighteenth century philosophers, but probably marks the last appearance of doctrinaire equalitarianism in the biological sciences. The elimination of this obstacle will make possible a more effective direction of human evolution.

(d) The fourth factor in evolution is inbreeding, or more broadly, assortative mating. This is not in itself a rapid means of bringing about evolutionary change, but it is nearly always associated with selection and isolation. Indeed, the four factors of evolution are always working together, or more exactly, at the same time. One may be pushing in one direction, while another drives the species in a contrary direction, and the final

trend of evolution represents the compromise between them, or the resultant of the various forces. Assortative mating with selection and isolation promotes evolutionary change rapidly, and therefore should be encouraged within reasonable limits as a measure of great eugenic importance.

With a general knowledge of the trends of evolution, as above set forth, and a general knowledge of the factors by which evolution actually occurs, man is today in a position to direct his own evolution, consciously, along lines that promise the greatest welfare to the species. It is a commentary on the irregular progress of science, however, that as this knowledge is gained, a point of view has at the same time found a few occupants, which limits the possibilities of the social direction of evolution by denying that the scientist has any right to say what is good or desirable or useful.

Such an attitude is based on a misconception of the function of science. In any field of social inquiry the student may consider three aspects. There is first the aspect of pure science, inquiring into what are the facts. There is the social philosophy with the consideration of what ought to be. And there is the third aspect, the social technology, with the consideration of how these objectives are to be achieved.

Strictly speaking, a social philosophy is not a science. In practice, however, the judgments of social philosophy are better when made after such scientific inquiries as these, "What are considered the objectives in other fields?", "What have been the objectives thus far proposed in this field?", and "What are the results in social technology of applying rival objectives?" These three inquiries as they represent a search for facts are all scientific.

The scientist is a better social philosopher concerning his own field than the tyro because he has made the three inquiries above listed. It is true that anyone's authority in social philosophy has less weight than in science or technology because the findings are reached not by reasoning deduced from observations, but by a comparison of the hypotheses, first as to

the extent that the hypotheses are consistent with the body of scientific facts and, second, as to results of attempts to apply the several objectives.

Lastly there is the technology of eugenics. How can society accomplish the objective? This is also in the realm of science because it is a scientific task to test the relative results of rival techniques. It is well, however, to distinguish this field of science as technology without yielding its claim of being science.

Occasionally some writer undertakes to scold the eugenicist for giving attention to all three of the inquiries just mentioned. No one, it is alleged, has a right to combine in himself the functions of a social philosopher, a pure scientist, and a social technologist. The critics go on to demand that eugenics expurge from its scope all consideration of the normative, that is, all consideration of what ought to be. The only legitimate field for study, these critics protest, is what is, not what ought to be.

If this plaint had any basis, the very word eugenics would have to be dropped, or at least beheaded by the removal of the *eu*. This declaration of an interest in "*good breeding*" expresses an objective in itself.

As a matter of common sense, it would be as absurd for the eugenicist to remove social philosophy from his science, as for the hygienist to remove it from his. In every division of social biology there is a goal to be discovered. The hygienist is not interested merely in describing how, when, and why people die. He is interested in preventing them from dying. It never occurs to him to deny that health is a desirable goal. Similarly the engineer is not taught merely the ways in which a bridge stands or falls. He is taught with a purpose, which is to be able to build bridges that will stand up and carry the traffic for which they are intended. No one reproaches the petroleum geologist for expressing a desire to find more oil, or an economist for trying to improve the tariff or the income tax by better legislation. The quality of their work as pure science is only enhanced by putting it to the service of mankind as directly as possible. Social philosophy and social technology have a

legitimate and honored place in human thought. They are indispensable to human progress or even to human survival. The attempt to eliminate them from eugenics or from other fields of social inquiry is not only unnecessary, unwise, unscientific. It is also a manifestation of an odd mental mechanism, the explanation of which may profitably be left to the specialist in mental hygiene.

The conclusion to be drawn from a study of man's evolution is clear. If the knowledge now freely available is put to use, the man of the future will be a better man, though not a markedly different man. He will not differ greatly in size or in body proportions, probably not greatly in span of life. But he will be better adapted to resist disease, will have a better integrated nervous system, a greater emotional stability, and a better intellectual endowment.

This does not mean, of course, that the differences between the wise and the stupid will not be great then as now. It means that the level of both will be raised or, more exactly, that the mean of the population will be shifted. The population as a whole will still be distributed in a frequency curve, in regard to any particular character. The most intelligent will still be much brighter than the least intelligent; but the best then will be better than the best now and the worst then will be better than the worst now.

There will still be diversity in the population in all other respects. On every account anything like a standardization of mankind or an approach to uniformity is out of the question. The real change that can be hoped for is a raising of the level of the whole mass. The population will have all kinds of valuable characteristics in higher degree, all kinds of harmful characteristics in smaller degree, than now.

This is no Utopian vision. It is a sober, serious forecast of the results that can be achieved by a people that will apply its present knowledge, without any radical or revolutionary procedures, to the organization of its own social life. It is the goal of eugenics.

## APPENDIX A

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## APPENDIX B

### GLOSSARY

*Acquired Character.* In a standard environment, a given genetic constitution will cause the development of a trait which varies but little about a certain mean. The mean of this trait is taken as representing the trait in its typical condition. But if the environment be not standard, but be considerably changed, the trait will usually develop a new mean different from the old one. Thus an American, whose skin in the standard environment of the United States would be blonde, may under the environment of Cuba develop into a brunette. Such a variation from the mean, thus caused, is called an acquired character.

*Adaptive Fecundity*, that size of family in a community which, in view of the marriage and death-rate at the time, keeps the population at an optimum size, or moves it toward the population optimum at a suitable rate. This may also be called an adjusted fecundity.

*Allelomorph* (one another form), one of a pair of genes which are alternative to each other in Mendelian inheritance. Instead of a single pair, there may be a group of "multiple allelomorphs," each member being a possible alternative to every other member of the group.

*Allelomorphism*, a relation between two or more genes, such that two which are present in one zygote do not both enter into the same gamete, but are separated into sister gametes.

*Biometry* (life measure), the study of biology by statistical methods, bio-statistics.

*Character* (a contraction of "characteristic"), a term which is used, often rather vaguely, to designate any function, feature, or organ of the body or mind.

*Chromosome* (color body, so called from its affinity for certain stains), a body of peculiar protoplasm, in the nucleus of the cell. Each species, has its own characteristic number. The cells of the human body contain 24 pairs of chromosomes each. The chromosome is significant as the vehicle of heredity. It is usually rod- or club-shaped, rarely spherical or elliptical.



*Collective* (kolkhoz), an organization of Soviet farm workers who, except for home garden and minor domestic animals, carry on their farm work in coöperative economy, being paid in proportion to the profitableness of the combined venture and in proportion to the quality and quantity of the individual's work.

*Congenital* (with birth), present at birth. The term fails to distinguish between traits which are actually inherited, and modifications acquired during prenatal life. In the interest of clear thinking its use should be avoided when inherited is meant.

*Correlation* (together relation), a relation between two variables in a certain population, such that for every variation of one, there is a corresponding variation of the other. But in regard to causation this statistical relationship may equally be due to the fact that both the variables are dependent on a third factor.

*Cytology* (cell word), the study of the cell, the constituent unit of organisms.

*Determiner* (completely end), an element or condition in a germ-cell supposed to be essential to the development of a particular quality, feature, or manner of reaction of the organism which arises from that germ-cell. The word has largely fallen into disuse, "gene" or "factor" taking its place.

*Dominance* (mastery), in Mendelian hybrids the capacity of a character which is derived from only one of two generating gametes to develop to an extent nearly or quite equal to that exhibited by an individual which has derived the same character from both of the generating gametes. In the absence of dominance the given character of the hybrid usually presents a "blend" or intermediate condition between the two parents.

*Dysgenic* (bad origin), tending to impair the racial qualities of future generations; the opposite of eugenic.

*Dysthenic*, tending to impair the human environment so as to decrease human welfare; the opposite of euthenic.

*Environment*, the world about the individual which affects him. It is the cause of the differences that appear between two individuals who start with the same germ-plasm. The differences between two identical twins are nearly all environmental in origin.

*Eugenic* (good origin), tending to improve the germinal qualities of future generations, either physical or mental.

*Euthenic* (good thriving), tending to produce beneficial acquired

characters or better conditions for people to live in, but not tending (except incidentally and indirectly) to produce people who can hand on the improvement by heredity. Euthenics was coined by Mrs Ellen Richards to mean the science of the controllable environment. It was intended as a coordinate word to eugenics. Since it includes social as well as physical environment, the two words eugenics and euthenics, taken together, cover the whole field of human progress.

*Evolution* (unroll), *organic*, the progressive change of living forms usually associated with the development of complex from simple forms.

*Factor* (maker), a name given to the hypothetical something, the independently inheritable element in the germ-cell, whose presence is necessary to the development of a certain inherited character or characters or contributes with other factors to the development of a character. "Gene" and "determiner" are sometimes used as synonyms of factor.

*Fecundal Selection* (fruitful), the evolutionary effect of such inheritable differences as may exist between those who have no or less children as compared with those who have more.

*Fecundity*, as used in this book means the number of children born, whereas fertility applies to the ability to produce children, whether or not they are actually produced. Thus some fertile stock may be infecund, but a fecund stock is necessarily fertile. Fecundity is often distinguished as gross, referring to all children born, or all pregnancies, and net, referring to the number of children who grow to adult life.

*Feeble-mindedness*, a condition in which mental development is retarded or incomplete. The customary criterion is the inability of the individual, because of mental defect existing from an early age, to manage himself or his affairs with ordinary prudence. American students usually distinguish three grades of mental defect. Idiots are those who are unable to take care of themselves, even to the extent of guarding against common physical dangers or satisfying physical needs. Their mentality does not progress beyond that of a normal two-year-old child. Imbeciles can care for themselves after a fashion, but are unable to earn their living. Their mental ages range from three to seven years, inclusive. Morons, who correspond to the common acceptance of the term feeble-minded, "can under proper direction become more or less self-supporting but they are as a rule incapable of undertaking affairs which demand judgment or involve unrestricted competition with normal individuals." Their intelligence ranges with

that of normal children from seven to twelve years of age. There is necessarily a considerable border line, but an adult whose intelligence is beyond that of the normal ten-year-old child is usually considered to be not feeble-minded

*Gamete* (mate), a mature germ-cell, in animals an ovum or spermatozoon

*Gene*, the physical basis of heredity. Observation and experiment show that the germ-cell contains thousands of distinct and separable substances which exist as minute particles and are arranged in linear order in the chromosomes. The development of the individual is due to the interaction of these genes with the surrounding cell-substance, and with the environment at large. The change of any single gene, either by internal alteration (mutation) or by substitution of some other gene for it in the shuffling of the chromosomes, involves some (not always visible) change in the development of the individual. Factor and determiner are synonyms used in earlier literature.

*Genetics* (origins), the study of variation and heredity, especially the latter, that is, the origin of the individual's traits.

*Genotype*, a unitary trait which is primarily germinal in origin.

*Germinal* (sprig), due to something present in the germ-cell. A trait is germinal when its basis is inherited,—as eye color,—and when it develops with nothing more than the standard environment, remaining relatively constant from one generation to another, except as influenced by reproduction.

*Germ-plasm* (sprig form), mature germ-cells and the cells from which they are produced.

*Haemophilia* (blood love), an inability of the blood to clot. It thus becomes impossible to stop the flow of blood from a cut, and one who has inherited haemophilia usually dies sooner or later from hemorrhage.

*Heredity* (heirship), is usually considered an organic resemblance based on descent, or the correlation between relatives. Better defined as the cause of the differences seen between individuals which grow to maturity in a standard environment, or "the persistence of certain cell-constituents (in the germ-cells) through an unending number of cell divisions."

*Heterozygote* (different yoke), a zygotic individual which contains both members of an allelomorphic pair.

*Homozygote* (same yoke), an individual which contains only one member of an allelomorphic pair, but contains that in duplicate, having

received it from both parents. A homozygous individual, having been formed by the union of like gametes, in turn regularly produces gametes of only one kind with respect to any given factor, thus giving rise to offspring which are, in this regard, like the parents; in other words, homozygotes "breed true." An individual may be a homozygote with respect to one factor and a heterozygote with respect to another.

*Hormones* (excitants), the secretions of various internal glands, which are carried in the blood and have an important specific influence on the growth and functioning of various parts of the body.

*Inborn* usually means gerininal, as applied to a trait, and it is so used in this book. Strictly speaking, however, any trait which appears in a child at birth might be called inborn, and some writers, particularly medical men, thus refer to traits acquired in prenatal life. Because of this ambiguity the word should be carefully defined when used, or avoided.

*Inherent* (in stick), as used in this book, is synonymous with germinal.

*Innate*, synonymous with inborn.

*Intelligence Quotient*, a measure of intelligence test scores which makes allowance for age. An individual's mental age is the age at which the same score is attained by the average person tested of that age. The I Q, as it is often abbreviated, is the mental age divided by the chronological age of the individual in question.

*Latent* (lie hidden), a term applied to traits or characters whose factors exist in the germ-plasm of an individual, but which are not visible in his body. It is usually synonymous with recessive.

*Law*, in natural science means a concise and comprehensive description of an observed uniform sequence of events. It is thus quite different from the law of jurists, who mean a rule laid down for the guidance of an intelligent being, by an agency having power over him.

*Lethal Selection* (death selection), the evolutionary effect of such inheritable differences as may exist between those who die early as compared with those who die later in their reproductive period.

*Mendelism*, a collection of laws of heredity so called after the discoverer.

*Mendelize*, to follow Mendel's laws of inheritance in a clearly apparent way.

*Mental Age*, of an individual is the age at which the individual

score is the same as the mean of those of that age tested in establishing the norms

*Modal*, adjective for mode.

*Mode*, in a series of measurements of a population is that quantity which is most frequent.

*Mores* (customs), the approved customs or unwritten laws of a people; the conventions of society; popular usage or folkways which are reputable, also called standards. The singular of mores is *mos*.

*Mutation* (change), a discontinuous change in a gene. In older literature the term was frequently used to designate profound change in the germ-plasm of an organism, such as would produce striking or far-reaching changes in its progeny. It is now known that most of these so-called mutations of the earlier literature were due to irregularities of chromosome distribution, and not to changes in single genes.

*Natal*, the adjective for the noun "birth-rate."

*Natural Selection*, the evolutionary effect of such inheritable differences as may exist between those who leave progeny or more progeny or earlier progeny as compared with those who leave no or fewer progeny or later progeny.

*Normal Curve*, the curve of distribution of variations of something whose variations are due to multiplicity of causes acting nearly equally in both directions. It is characterized by having some individuals at a mediocre degree and progressively fewer above and below this mode. In outline it resembles a bell or an ogive.

*Nucleus* (little nut), a central, highly-organized part of every living cell, which plays a directive rôle in cell-development and contains, among other things, the chromosomes.

*Nuptial*, the adjective for the noun "marriage." Nuptial rate is a marriage rate.

*Patent* (lie open), a term applied to traits which are manifestly represented in the body as well as the germ-plasm of an individual. The converse of "latent."

*Phenotype*, a trait as expressed in the body, whether or not it is inherited

*Population Optimum*, the size of population of any region which is such that either an increase or decrease in the number decreases the welfare per individual

*Protoplasm* (first form), "the physical basis of life"; a chemical compound or mixture of numerous compounds. It contains proteins which differ slightly in many species of organism. It contains carbon, hydrogen, oxygen, nitrogen, sulphur, and various salts, but is so complex as to defy exhaustive analysis.

*Psychiatry* (soul healing), the study of diseases of the mind.

*Recessive* (draw back), the converse of dominant, applied to one of a pair of contrasted Mendelian characters which does not appear in the presence of the opposing gene.

*Regression*, used by Galton to mean the average return of the magnitude of a trait in the progeny from the parents to the central tendency of that trait in all the recent ancestry.

*Segregation* (aside flock), (1) as used in eugenics means the policy of isolating feebleminded and other dysgenic individuals from the normal population into institutions, colonies, etc., where the two sexes are kept apart. (2) The term is also used technically in genetics to refer to the discontinuity of the variation of characteristics resulting from the independent distribution of genes before or at the time of formation of the gametes

*Selection* (apart pick), the choice (for perpetuation by reproduction) from a mixed population, of the individuals possessing in common a certain character or a certain degree of some character. Two kinds of selection may be distinguished (1) natural selection, in which choice is made automatically by the failure to reproduce (through death or some other cause) of the individuals who are not "fit" to pass the tests of the environment (vitality, disease resistance, speed, success in mating, or what not); and (2) artificial selection, in which the choice is made consciously by man.

*Sex-limited*, a term applied to traits which differ in the two sexes, because influenced by the hormones of the reproductive glands. Example, the beard. Partial or even complete expression of such a trait may be possible if the endocrine glands are disordered; thus beards, though characteristically a sex-limited trait in man, are not unknown in women. Necessary as are the sex-hormones for the appearance of a sex-limited character, the genetic basis is fundamental. The hormones themselves are merely the outgrowth of the individual's genetic constitution.

*Sex-linked*, a term applied to traits which have no necessary and physiological connection with sex, as have the sex-limited traits men

tioned in the preceding paragraph; but whose association with sex is purely accidental, so to speak, and due to the fact that their genes are located in one of the sex-chromosomes. Usually this will be in the X-chromosome of the female, since the Y-chromosome of the male has few identified genes in man. Color-blindness is the classical example in man. Since the confusion between sex-linked and sex-limited traits is frequent, the differences may be diagrammed thus. the sex-linked trait is due (1) to a gene located in the sex-chromosome, it (2) has no physiological connection with either sex, but is merely associated with one accidentally, because of the location of the gene in that chromosome; and (3) it occurs in some, but not in all, the members of a given sex. The sex-limited trait, on the other hand, is (1) due to a gene which may be located in any chromosome except a sex-chromosome, (2) its association with sex is not accidental, but physiological, and (3) it is found normally in all the members of a given sex but in none of the opposite sex.

*Sexual Selection*, the conscious or unconscious preference by individuals of one sex for individuals of the other sex who possess some particular attribute or attributes in a degree different from the species. If the deviation of the chosen character is in the same direction (plus or minus) as in the chooser, the mating is called assortative; if in one direction independent of the characteristic of the chooser, it is called preferential.

*Sib* (kin) or *sibling* is an old Anglo-Saxon word, now used widely to mean a brother or sister. It supplies the place of a word, lacking in the English language, to designate such a person irrespective of sex, as does the German noun *Geschwister*.

*Soma* (body), the body as distinguished from the germ-plasm. From this point of view every individual consists of two parts,—germ-plasm and soma or somatoplasm.

*Standard*, a type of social behavior in a community considered reputable, same as *mores*.

*Trait*, synonym of "character."

*Unit Character*, a term used in the older literature to apply to a character or alternative difference of any kind, which is inherited in a Mendelian fashion and is apparently not capable of subdivision in heredity but is inherited as a whole, and is capable of becoming associated in new combinations with other characters. The term has largely gone out of use, since it makes for clearer thinking about heredity to

fix the attention on the genes in the germ-cells instead of on the characters of the adult.

*Variation*, a deviation in the size, shape, or other feature of a trait, from the mean of that character in the species.

*Zygote* (yoke), the fertilized egg-cell, the united cell formed by the union of the ovum and spermatozoön after fertilization.



## APPENDIX C

### PROBLEMS OF APPLIED EUGENICS

*Suggestions for Instructors.*—Early in the term it is well to assign problems on a mimeographed sheet, which may also carry assignments for outside reading. Many instructors have found problems more valuable than collateral reading, and have reduced the amount of the latter. Time and library facilities available are usually decisive factors, but wherever possible it is desirable that each student read at least one extra book parallel to the text, in order to get the benefit of different points of view and methods of presentation. Following, in alphabetical order, are a few books widely available and particularly useful to students of eugenics.

- BAUR, E., E. FISCHER, and F. LENZ. Human Heredity.  
CARR-SAUNDERS, A. M. The Population Problem.  
CONKLIN, E. G. The Direction of Human Evolution.  
DARWIN, L. The Need for *Eugenic Reform*.  
EAST, E. M. Heredity and Human Affairs.  
FISHER, R. A. *Genetical Theory of Natural Selection*, Chapters 8-12  
incl.  
GALTON, F. *Inquiries into Human Faculty*.  
GATES, R. R. Heredity in Man.  
GUYER, M. F. Being Well Born  
HOLMES, S. J. The Trend of the Race.  
———. *Studies in Genetics and Eugenics*.  
HUNTINGTON, E., and L. F. WHITNEY. The Builders of America.  
POFENOE, P. The Conservation of the Family.  
———. The Child's Heredity.  
SCHILLER, F. C. S. Eugenics and Politics.  
———. Social Decay and Eugenical Reform.  
THOMPSON, WARREN S. Population Problems.

Chapters on eugenics in general textbooks of genetics and sociology may likewise be used. The student should be prepared to state any

deviation in point of view of the author assigned, from that of the textbook and to weigh the two, or to supply what he considers valuable additional evidence on any important point, from the outside reading. Reviews of articles in current publications should also be assigned. If time permits the student will find preparation of a minor research particularly valuable. This may well be taken from contemporary conditions in the student's own environment. Among subjects frequently assigned are the following

1. Inheritance of a trait in the student's or some other accessible family.
2. A report in full on a pair of identical twins.
3. Investigation of the workings of sexual selection as observed in the alumni or from other accessible data.
4. A study of the student's own ancestry from the eugenic point of view. Schedules supplied by the Eugenics Record Office are often used for this purpose.
5. Critical examination of some institution, law, or custom of eugenic or dysgenic bearing.

Written consideration of special problems may well be required at each session of the class. These are intended to oblige the student to exercise his own critical judgment and powers of observation, and to link up his readings with his daily experiences. The following problems are not review questions on the text, but are intended to take the student beyond the text and put him on his own resources. Many of them lend themselves well to class discussion. Students should be encouraged to feel that they will be rewarded not so much for arriving at an opinion coinciding with that of the textbook or of the instructor, as for using independent judgment and being prepared to support this by logical reasoning. Some of the problems particularly lend themselves to division of opinion, and it is worth while to announce how the class stands, pro and contra, and to discuss the merits of each side. The goal is not the handing out of authoritative or dogmatic opinions, but the encouraging of a habit of inquiry with reference to the fundamental principles of eugenics. In some cases, pooling of the results when the entire class has collected information on the same problem will produce a real contribution to knowledge. Students may often be encouraged to think out original problems of their own. In this way, or by addition of new problems by the instructor, the list may be greatly extended if necessary. The instructor will use his own judgment as to when stu-

dents should be allowed to select their own problems, and when one problem should be assigned to the entire class.

#### CHAPTER I. NATURE OR NURTURE

1. Describe a case in your observation of a pair of brothers or a pair of sisters who differ markedly in physical characteristics. What can you find in their heredity or their environment to explain the differences?

2. Same problem, but discussing mental differences.

3. Among your own physical traits, which ones seem to you to be determined more by inheritance, and which ones more by environment?

4. Same problem, but considering mental traits.

5. Describe some great man or great woman whose parents gave no known evidence of mental superiority. Is there evidence of actual mental inferiority on the part of either parent? Is there evidence that either parent was germinally mediocre, or is there merely a lack of evidence of superiority?

#### CHAPTER II. MODIFICATION OF THE GENES

1. Suppose the effects of use and disuse were markedly inherited. What difference would it make in social life, and in the eugenic program?

2. Ask several mature women if they ever heard of a case of maternal impressions or "marking." If they cite cases, do they give convincing evidence, or do you find other explanations that cover the ground?

3. Describe some alcoholic family known to you. Can you see any indications of relationship between alcohol and heredity?

#### CHAPTER III. DIFFERENCES AMONG MEN

1. Suppose that all men were germinally equal in mental ability. What difference would it make in social life and in the eugenic program?

2. Study any body of data such as the intelligence quotients or scholarship marks of a school, the heights or weights of a body of men or women, and find whether they can be arranged in a normal curve. If not, do you see any explanation?

3. List 10 differences between men and women that appear to be

of some importance in their daily behavior, and state in each instance whether the difference seems to be more germinal or environmental.

#### CHAPTER IV. THE INHERITANCE OF HUMAN DIFFERENCES

1. Consider the twins you know who are most alike. Are they "identical"? Why do you think so? Discuss their resemblances and differences. If you do not know any twins, take a case from literature or from current scientific publications.

2. Which of the less common characteristics in yourself, your brothers, and your sisters, can you find in some of your other relatives?

3. Make a pedigree chart of such of your relatives as you can remember or of whom you are reliably informed. Pick out two or three characteristics and show the distribution of these traits on this chart. Eye color is a good one to start with.

4. Chart the ancestry of some mentally defective individual who is known to you.

#### CHAPTER V. NATURAL SELECTION (1. LETHAL)

1. What would you reply to one who contends that, inasmuch as natural selection has always guided human evolution, society should take pains not to interfere with its action?

2. Discuss in some detail the selective nature of deaths from automobile accidents.

3. Find what the course of the infant mortality rate has been in your own community during the last decade or longer. What factors do you think mainly account for its course?

4. College athletes have, on the average, a shorter expectation of life than other students. What is the evolutionary result?

5. Chart the changes in the general death-rate and the birth-rate of your community for the last decade or longer. If possible, compare these curves with those for the whole population of the United States.

#### CHAPTER VI. NATURAL SELECTION (2. REPRODUCTIVE)

1. Describe some family known to you that has been the recipient of public charity for five or ten years. How many children does it contain? Have any children been born since the family began to depend on charity? So far as you can judge, what is likely to be the future value of these children to society. large or small?

2. If there is a considerable foreign-born population in your community, tabulate the birth announcements in the newspapers for a few weeks and classify them, so far as can be done by family names, on the basis of their nationality.

3. Make a chart showing the number of children born to your near relatives in the present generation, compared with those born in the preceding generation.

4. Ask 10 students how many brothers and sisters they have. Note how many of them come from families that are large enough to perpetuate themselves.

5. Think of the happiest and the unhappiest married couple known to you. How many children has each? (Select couples that have been married long enough to have completed their families)

#### CHAPTER VII. THE NEED FOR NEGATIVE EUGENICS

1. Which do you think is the superior right the right of every individual to marry and have children, or the right of society to prevent the reproduction of the unfit? Why?

2. Describe the activities of three important social welfare agencies in your community. Can you see that these activities have either eugenic or dysgenic effects? If so, what?

3. A philanthropist is contemplating a bequest for the advancement of eugenics. He is in doubt as to whether he should leave this to promote (a) research on the genetics of human traits, or (b) work along educational and legislative lines to put the eugenic program into effect. He asks your advice. What have you to say?

4. Find out what your county is paying annually or biennially for the maintenance of charities, the care of dependents, and the prevention of crime.

#### CHAPTER VIII. SELECTIVE SEGREGATION

1. Make a list of institutions in your county or your state that provide segregation of certain classes of the population. Whom do they take, how many, and at what cost?

2. Can you see ways in which the cost might be reduced without social damage or eugenic loss?

3. What new facilities for segregation are particularly needed by your state?

4. Many feeble-minded and insane persons are now kept in county jails and state prisons. Is that satisfactory? If not, why not, and how would you contrive to separate them?

5. Reforms in the treatment of delinquents and criminals are being discussed continually. Name two or three such proposed reforms and discuss their eugenic aspects.

#### CHAPTER IX. SELECTIVE STERILIZATION

1. If you were a state legislator, would you think it more important at your first session to work for a sterilization bill, or to get appropriations for additional segregation facilities? Why?

2. What arguments against a sterilization bill would you expect to encounter, and how would you answer them?

3. Ask five mature persons, not connected with education, whether they are in favor of eugenic sterilization. Tabulate the reasons they give for or against. Indicate in each case whether you believe the individual fully understood what sterilization is and what it is not, or whether he was misinformed.

4. Can you think of any great man or great woman in history, who would not have been born if it had been the custom at that time to sterilize insane and feeble-minded persons?

#### CHAPTER X. SELECTIVE CONTRACEPTION

1. How does knowledge of contraception spread from one country to another?

2. Does contraception require regulation by law? If so, what provisions would you suggest and how should they be enforced?

3. Outline a program of public education and administration that would secure the greatest good and the least harm from the use of contraception.

4. Do you think that knowledge of contraception leads to premarital sexual experiences on the part of young people? If so, what is the most effective measure to prevent this?

#### CHAPTER XI. MARRIAGE AND DIVORCE LEGISLATION

1. Make a list of all the divorced people well known to you (either personally or by reputation), dividing them to show which have

remarried and which have not. Note in each case whether you think the choice of a mate was better the first time or the second time.

2. Tabulate marriages of persons previously divorced, as to whether they have or have not had children in the second marriage.

3. What do you think was the basis of the strong tabu that has in so many countries and periods forbidden or frowned upon cousin marriages?

4. List the legislation restricting marriage in your own state. How much of this is eugenically valuable, how much of it should be repealed, and what new laws should be added?

5. Contrast half a dozen particularly happy marriages of your acquaintance, and half a dozen particularly unhappy marriages. Is any general difference observable between the two groups as to age at marriage?

## CHAPTER XII. EUGENIC ASPECTS OF WAR

1. Describe any man known to you, or of whom you have read, who was killed in the World War. Did he leave enough children to replace him? Do you think his children would be above or below the average of the population?

2. Discuss any one of the minor wars of the last 100 years, as to its eugenic aspects.

3. Do you consider that the influence of women, as a whole, is toward glorifying war or toward glorifying peace? Give illustrations and reasons in support of your view.

4. What are the eugenic aspects of (a) compulsory military training in colleges, and (b) of the R.O.T.C. in high schools and colleges?

## CHAPTER XIII. EUGENICS AND RELIGION

1. Analyze the eugenic aspects of some religion that is not discussed in this chapter.

2. Contrast the two congregations that you know best, as to their respective eugenic activities.

3. Tell of any particularly successful illustration known to you, of eugenical activities on the part of any church in the United States.

4. Describe some Old Testament custom that you consider markedly eugenic or dysgenic as the case may be

CHAPTER XIV. THE IMPROVEMENT OF REPRODUCTIVE SELECTION  
(1. SEXUAL)

1. Give the traits in order of importance which you think should be most decisive in the choice of a mate

2. In your own case, do you think that before you studied the subject, your order of importance of desirable traits would be the same as it is now? If not, what are the differences in your two lists?

3. The chapter lists a number of defects which women mentioned in the education of modern men for marriage and parenthood. Make a similar list of defects in the education of modern women for marriage and parenthood

4. Would it be eugenically valuable if custom allowed women to take the initiative and play a more active rôle in courtship activities? If so, in what ways should a change be made, and why?

5. Contrast the masculine traits which most appeal to women, with the feminine traits which most appeal to men. Is there any difference in their eugenic value?

6. The text quotes students' views as to how the church might make a greater appeal to young people and might serve their eugenic interests. Which three suggestions offered seem to you most valuable? Which three seem least valuable, or impracticable? What suggestions, if any, would you add to the list?

7. Many honorary fraternities, such as Phi Beta Kappa, are functioning successfully on a co-sexual basis. Would it be desirable to introduce co-sexual social organizations to compete with the present fraternities and sororities? Why? (Compare the experience of world educational cruises.)

8. Write a new problem on this chapter, to be used next year by the class.

CHAPTER XV. THE IMPROVEMENT OF REPRODUCTIVE SELECTION  
(2. FECUNDAL)

1. If health and money were proportionate, how many children would you like to have?

2. When eugenicists urge superior parents to have larger families,



is there any limit to the size of family desirable? If so, on what is the limit based?

3. Describe in detail the one economic measure that you consider more important than any other, to bring about in a practical way larger families among mentally superior people.

4. List (not by name) 10 men or women known to you personally or by repute, who have achieved conspicuous success in the world and who are still celibate. State in regard to each one whether you think it is eugenically desirable that he or she has no children, and why

5. List as many women of genius or great distinction as you can think of, who have had normal families of children (four or more children brought to adult years). Exclude women whose historical position is adventitious, due to inheritance of a throne, or who shine merely in the reflected light of a husband.

6. What do you consider the one most important change that could be feasibly made in modern education, that would promote the production of more children by particularly intelligent married persons?

#### CHAPTER XVI. EUGENIC ASPECTS OF RACE AND NATION

1. A philanthropist wishes to finance a research on infants, the results of which would go far to settle the questions of the real nature of racial and class differences. Suppose that you were asked to be director of this research. Outline fully the lines that such an investigation should follow.

2. Assuming that it is desirable, for the present at least, to maintain a "color line," where is the line to be drawn between justifiable and unjustifiable discrimination? Explain fully.

3. Three successive presidents vetoed immigration restriction legislation. Since the last one, there has been a widespread agreement as to the desirability of such restriction. How do you account for this change in public opinion?

4. Would you displace the present system of restricting immigration on the basis of nation and race (National Origins) by a system depending entirely on the personal qualifications of the individual? Why?

5. Prepare a graph showing the distribution of the principal nationalities and/or races in your own state (material easily available from census reports).

CHAPTER XVII. EUGENIC ASPECTS OF SOME  
EUTHENIC MEASURES (1. SOCIAL)

1. Granting that there was a widespread conviction of the desirability of eugenic improvement, as well as a realistic appreciation of variation and heredity, would a society in which government was entirely socialistic find its task easier or harder than that of the government of a society based on capitalistic principles? Why?

2. Is eugenics to be thought of as individualistic or collectivistic? Classify the features of eugenics that are individualistic, and those that call for some collectivistic aspects of social control which a strict individualist would necessarily disapprove.

3. How can you reconcile the principle of compulsory education and the fact that all children can not profit by the same education up to the same age? If you would differentiate between children, what would be your answer to those who say that differentiation, as it produces class stratification, is unfair and undemocratic?

4. Do you personally like people who are more highly or less highly sex differentiated? What is your own ideal for yourself in this respect?

5. What is the minimum age that you would recommend for child labor, if a federal law were adopted? Would you permit the child worker in any kind of employment? Would the age and exceptions be the same regardless of sex? Reasons.

6. Outline a practicable program for vocational guidance in the high schools, with particular reference to eugenic factors

CHAPTER XVIII. EUGENIC ASPECTS OF SOME  
EUTHENIC MEASURES (2. ECONOMIC)

1. What precautions would be necessary to minimize any tendency a mother's pension may have to act dysgenically, and yet retain its principal advantages?

2. Discuss the biological effects of the division of a continent into many small nations with high tariff walls.

3. At what income level do you think fecundity is most encouraged in your community? What effect should this have in framing income tax schedules?

4. What precautions should be observed in framing an old age pension, to prevent it from acting dysgenically?

5. Make a list (without names) of 10 couples of superior ability, in

your acquaintance, who have not more than two children each and whose families are presumably complete. Note beside each one whether you think this limitation is primarily due to economic factors, or to others.

#### CHAPTER XIX. HISTORY OF THE EUGENICS MOVEMENT

1. In what connection did you first encounter the word Eugenics, and what was your impression of it at that time?
2. Inquire of several persons whom you consider ultra-conservative and several others whom you consider to be radically-minded, whether they approve of eugenics. Classify their answers.
3. In what countries do you consider eugenics likely to make the most advance during the next 100 years, and in what countries do you expect it to be most retarded? Why?
4. Mention some factor that the text has ignored or in your opinion has not sufficiently stressed, that you think presages a good outlook for the eugenics program in the near future.
5. Similarly, give some additional factor that makes the eugenic outlook less favorable.

#### CHAPTER XX THE DIRECTION OF HUMAN EVOLUTION

1. The charge is frequently made that eugenists want to produce a race of men who will be all alike. Can you find in any eugenic literature anything that might be considered to justify this statement?
2. Eugenics has been called "a charity to end charity." What could be said to support such a thesis? What could be said against it?
3. Name three eugenic measures which are almost equally euthenic.
4. What changes do you think are likely to take place in the organization of the family in the United States during the next 100 years?
5. Do you consider that substantially the same ideal or goal can be adopted by eugenists in every country, whether advanced or retarded in civilization, whether occidental or oriental, whether white or black? If not, what changes would be found in their programs?



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